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N. MANIVANNAN
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Yogesh Avasthi
Editor

Editorial Correspondence
Editor, Indian Railways
411, Rail Bhawan, New Delhi-110001
Email: editorindianrailways@gmail.com

Business Communications
Lalit Kumar Dhankar
Business Manager Indian Railways,
310, Rail Bhawan, New Delhi-110001
Tel : 47845378, 45378 (Rly.).
011-47845089, 45089 (Rly.)
Email : bmpr310rb@gmail.com

Editorial Assistance
Geeta Srikala

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9 Vande Bharat Express
Covering 11 States

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Editorial



Indian Railways is setting new records. Recently, occasions like the simultaneous inauguration of five 'Vande Bharat Express' or laying the foundation stone for the redevelopment of 508 stations were nothing short of a golden historical milestone, but leaving this record far behind, the Indian Railways has created a new history by running nine 'Vande Bharat Express' on the same day on 24th September, 2023. These nine 'Vande Bharat' trains were flagged off by Hon'ble Prime Minister Shri Narendra Modi through video conferencing. These trains will boost rail connectivity in 11 states namely Rajasthan, Tamil Nadu, Telangana, Andhra Pradesh, Karnataka, Bihar, West Bengal, Kerala, Odisha, Jharkhand and Gujarat. A total of 34 'Vande Bharat' trains (68 services) including these nine trains are running.

Equipped with world-class facilities and advanced security features including KAVACH, these trains are providing modern, quick and comfortable means of travel to the common people, professionals, businessmen, students and tourists. This is a good example of the popularity of these trains that before 24th September, 2023, more than 1 crore 11 lakh people had travelled by Vande Bharat trains.

Now people's rail travel experiences are changing. Nowadays, people are talking about how much the stations have changed, how much the operation of trains has improved, the good behaviour of TTEs, security arrangements, quality of food etc. Advising railwaymen to be constantly sensitive to people's needs, the Hon'ble Prime Minister also congratulated the railway personnel.

The Hon'ble Prime Minister further said that if the train is a moving home for the passengers in the Indian Railways, then our stations are also like their temporary homes. Indian Railways are now modernizing its stations and in this context 508 stations are being redeveloped under the 'Amrit Bharat Station' Scheme. He said that every station has its own foundation day, now the tradition of celebrating the foundation day of the station has started in the Indian Railways. Recently, on the completion of 150 years, the foundation day of many stations including Coimbatore Railway Station, Chhatrapati Shivaji Terminus and Pune was celebrated with zeal and enthusiasm.

Indian Railways is moving towards dedicating many such projects on the world stage to the nation, about which we will keep you informed through this Magazine.

Please share your feedback with us. We shall be waiting.....

Probationers of Indian Railways Called on the Hon'ble President



Probationers (2019, 2020 and 2021 Batch) of Indian Railways called on the Hon'ble President, Smt Droupadi Murmu at Rashtrapati Bhavan. Also seen are Shri Naveen Gulati, Member (T&RS), Ms. Anjali Goyal, Member (Finance), Shri Roop Narayan Sunkar, Member (Infrastructure), Shri Manoj Yadava, Director General/RPF and Shri Braj Mohan Agrawal, Director General (Safety)

A group of 255 probationers (2018 batch) and 213 probationers (2019, 2020 and 2021 batch) of Indian Railways called on the Hon'ble President of India, Smt. Droupadi Murmu at Rashtrapati Bhavan Cultural Centre on 14th September and 15th September, 2023 respectively.

Addressing the probationers, the Hon'ble President said that the Indian Railways is the backbone of not just the Indian economy but also of India's unity and socio-cultural diversity. She emphasised that it is the responsibility of the young officers like them to carry forward the rich legacy of the railway ecosystem and strive to make Indian Railways the provider of best quality services in the world. The Hon'ble President said that technology is the driving force in all fields today. She highlighted that for Indian Railways which caters to the needs and demands of millions of people every day and transports millions of tonnes of freight every month, harnessing technology to the best extent possible is a must. She urged young officers to contribute in charting a new path in technological advancement of the country by devising new applications and systems for people-friendly and eco-friendly transportation system. The Hon'ble President said that people who travel in trains carry with them the memories of their journeys. She urged officers to treat the passengers as their guests and provide the best service and best experience that they can cherish. She also underlined the need to ensure safety of passengers by all means. She said that with the advanced technology and Artificial Intelligence-based-applications, efficient and foolproof systems should be designed giving utmost priority to rail safety.



Probationers (2018 Batch) of Indian Railways called on the Hon'ble President, Smt Droupadi Murmu at Rashtrapati Bhavan. Also seen are Shri Naveen Gulati, Member (T&RS), Ms. Anjali Goyal, Member (Finance), Shri Roop Narayan Sunkar, Member (Infrastructure), Shri Manoj Yadava, Director General/RPF and Shri Braj Mohan Agrawal, Director General (Safety)

Hon'ble PM Flagged Off



9 VANDE BHARAT EXPRESS

Hon'ble Prime Minister, Shri Narendra Modi flagged off nine Vande Bharat trains on 24th September, 2023 via video conferencing. These new Vande Bharat trains are a step towards realising Prime Minister's vision of improving connectivity across the country and providing world class facilities to rail passengers.

Speaking on the occasion, the Hon'ble Prime Minister said that the expansion of modern connectivity in the country is an unprecedented occasion. The speed and scale of infrastructure development is matching the aspirations of 1.4 billion Indians perfectly. This is what today Bharat desires are. These are the aspirations of the youth, entrepreneurs, women, professionals, businessmen, and those associated with jobs. Today, the inauguration of 9 Vande Bharat trains simultaneously is an example of this. Today, people from Rajasthan, Gujarat, Bihar, Jharkhand, West Bengal, Odisha, Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, and Kerala have got the facility of Vande Bharat Express. The trains launched today are more modern and comfortable compared to the ones before. These Vande Bharat trains symbolize the new energy, enthusiasm, and aspirations of new Bharat. I am also delighted that the craze for Vande Bharat is continuously increasing. So far, more than 1 crore and 11 lakh passengers have travelled by these trains, and this number is increasing day by day.



People from different states and centrally governed territories of the country have been benefitting from the services of 25 Vande Bharat trains so far. Now, an additional 9 Vande Bharat Express trains are being added to this network. The day is not far when Vande Bharat will connect every part of the country. I am pleased that Vande Bharat Express is fulfiling its purpose admirably. These trains have become important for those who want to



Minister of Railways, Shri Ashwini Vaishnaw was also present on the occasion. of flagging off of Vande Bharat trains through video conferencing. by Hon'ble Prime Minister, Shri Narendra Modi

minimize travel time. These trains have become highly essential for people who wish to finish their work in another city within a few hours and return on the same day. Vande Bharat trains have also accelerated tourism and economic activities. Wherever the Vande Bharat Express service has reached, the number of tourists has increased there. An increase in the number of tourists implies a rise in the income of businesses and shopkeepers in those areas. This is also creating new employment opportunities there.

The world has praised our vision of women-led development. Building on this vision, the government introduced the 'Nari Shakti Vandan Adhiniyam' in Parliament. Since the introduction of the Nari Shakti Vandan Adhiniyam, discussions are happening about the contribution of women and their increasing role in every sector. Today, several railway stations are being operated entirely by female employees. I commend such efforts, and I congratulate all the women in the country once again for the Nari Shakti Vandan Adhiniyam.

Amidst this confident atmosphere, Bharat of the 'Amrit Kaal' (golden era) is working simultaneously on its present and future needs. From planning infrastructure to its execution, all stakeholders are collaborating, and for this purpose, the PM Gati Shakti National Master Plan has been made. In order to reduce transportation costs in the country and minimize the cost of our exports, a new logistics policy has been implemented. Emphasis is being placed on multi-modal connectivity to support one mode of transport with another in the country. The overarching goal of all these initiatives is to enhance the ease of travel and save valuable time for the citizens of Bharat. These Vande Bharat trains are a reflection of this sentiment.



Dignitaries present at Tirunelveli Railway Station at the inaugral function of Vande Bharat Express between Tirunelveli and Chennai Egmore

The Indian Railways is the most dependable companion of the poor and the middle class people in the country. The number of people travelling by train in one day in our country is more than the population of many countries. Unfortunately, not much attention was given to modernizing the Indian Railways in the past. But now, our government is committed to the transformation of the Indian Railways. The government has made an unprecedented increase in the rail budget. This year, the budget for railways is eight times more than what it was in 2014. There is rapid progress in the doubling of rail lines, electrification, running new trains and building new routes.

If trains are the moving homes for passengers in Indian Railways, then our railway stations are like their temporary homes. A developed Bharat needs to modernize its railway stations. With this vision, a campaign for the development and modernization of railway stations has been launched for the first time in Bharat. Today, there is a record number of foot overbridges, lifts, and escalators being built for the convenience of rail passengers in the country. Just a few days ago, the work of revamping over 500 major stations in the country began. These newly developed stations in the 'Amrit Kaal' will be known as 'Amrit Bharat Stations'. These stations will soon become the identity of the new Bharat in the days to come.



Dignitaries at Kasaragod Railway Station on the occasion of flagging off of Kasaragod - Thiruvananthapuram Vande Bharat Express

Every railway station, no matter what, has its own foundation day. I am pleased that now Indian Railways has started celebrating the foundation day of railway stations. Recently, the foundation day of several stations, including Coimbatore in Tamil Nadu, Chhatrapati Shivaji Terminus in Mumbai and Pune, was celebrated. Coimbatore Railway Station has completed 150 years of serving passengers. The people there naturally take pride in such achievements. This tradition of celebrating the foundation day of railway stations will be expanded, connecting more and more people.

My family members, Bharat has turned the vision of 'Ek Bharat, Shreshtha Bharat' into a reality with unwavering determination in the 'Amrit Kaal'. When the country celebrates 100 years of independence in 2047, the development of every state, the development of every state's people, is just as crucial as the goal of achieving a developed Bharat by 2047. Now, the country cannot afford to risk holding any state back. We must continue to move forward with the vision of 'Sabka Saath, Sabka Vikas'.

Today, I want to say something to our hardworking railway employees as well. When someone travels from one city or a distant place, the first thing they are asked is how their journey was. That person not only shares his travel experience but also talks about the entire journey from leaving home to reaching his destination. He mentions how much railway stations have changed, how well the trains are managed, and he describes various aspects of his experiences, including the behaviour of the TTE, the use of



On the occasion of flagging off of Udaipur-Jaipur Vande Bharat Express from Udaipur Railway Station, Shri Kailash Choudhary, MoS for Agriculture, Shri Ajunlal Meena, MP (Udaipur), Shri Chandra Prakash Joshi, MP (Chittorgarh) and Shri Phool Singh Meena, MLA (Udaipur Rural) were present.

tablets by him instead of paper, security arrangements, and the quality of food. Therefore, maintaining a continuous sense of empathy and dedication to providing passengers with a good travel experience is essential for every railway employee. It is heartening to hear such positive feedback these days, with people saying, "It was so good, it was so nice," and that brings a great sense of joy. So, I congratulate all the committed railway employees as well from the bottom of my heart.

Indian Railways has set new standards for cleanliness, which every citizen has noticed. Compared to the past, our stations and trains are much cleaner now.

I believe that the changes happening at all levels in Indian Railways and society will be a significant step towards a developed Bharat. Once again, I extend my best wishes to the people of the country for the new Vande Bharat trains.

Governors, Chief Ministers, Ministers, Minister of Railways, Shri Ashwini Vaishnaw and Members of Parliament were among those present on the occasion.

Background

These nine trains will boost connectivity across eleven states namely Rajasthan, Tamil Nadu, Telangana, Andhra Pradesh, Karnataka, Bihar, West Bengal, Kerala, Odisha, Jharkhand and Gujarat. These Vande Bharat trains will be the fastest train along the routes of their operation and will help save considerable time of the passengers.

Rourkela – Bhubaneswar – Puri Vande Bharat Express and Tirunelveli–Madurai–Chennai Vande Bharat Express will connect important religious towns of Puri and Madurai. Also, the Vijayawada – Chennai Vande Bharat Express will operate via the Renigunta route and will provide connectivity to Tirupati Pilgrimage centre.

The introduction of these Vande Bharat trains will herald a new standard of rail service in the country. These trains, equipped with world class amenities and advanced safety features, including Kavach technology, will be a key step towards providing modern, speedy and comfortable means of travel to common people, professionals, businessmen, student community and tourists.



Salient Features of Vande Bharat Express



Gangway for contemporary exterior look as well as for free passenger movement

Automatic Plug Doors with Sliding Foot Steps



Continuous sealed windows with provision for emergency exit





FRP-Interior panelling
Corrugated FRP roof panel design to improve aesthetics



Special air conditioning duct for silent and equal distribution of conditioned Air. Automatic sensor for temperature adjustment

Partitions with electrically operated touch free sliding doors.



Sunk in type Tip-up seat





Emergency alarm push buttons inside the compartment.



Emergency talk back unit inside and outside the seating area

Indirect LED lighting for calmer ambience like aircraft



Mobile charging point at every seat





Revolving seats in Executive class



Mini pantry in each coach

For Divyangjan passengers
Special lavatory in DTC



Hon'ble PM Dedicated to the Nation Railway Projects Worth Around ₹6,350 cr. in Raigarh, Chhattisgarh



Hon'ble Prime Minister, Shri Narendra Modi dedicated to the nation several rail sector projects worth around ₹6,350 crore in Raigarh, Chhattisgarh. Minister of State for Tribal Affairs, Smt Renuka Singh Saruta and Deputy Chief Minister of Chhattisgarh, Shri T S Singhdeo were also present on the occasion

The Hon'ble Prime Minister, Shri Narendra Modi dedicated to the nation several rail sector projects worth around ₹6,350 cr. in Raigarh, Chhattisgarh on 14th September, 2023.The railway projects include Chhattisgarh East Rail Project Phase-I, 3rd rail line between Champa to Jamga, 3rd rail line between Pendra Road to Anuppur and MGR (Merry-Go-Round) system connecting Talaipalli Coal Mine to NTPC Lara Super Thermal Power Station (STPS).

Addressing the gathering, the Hon'ble Prime Minister remarked that Chhattisgarh is taking a significant step towards development as Railway projects worth more than ₹6,400 cr. are being unveiled in the state. He underlined that various new projects are being initiated today to expand the energy-producing capacity and improve the healthcare sector of the state. The Hon'ble Prime Minister emphasized that the entire world is not only witnessing but also heaping praise on the fast pace of modern development and the Indian model of social welfare. 'Chhattisgarh is a powerhouse of development of the country', the Hon'ble Prime Minister remarked as he noted that a country will move forward only if its powerhouses are working at full strength. In the last 9 years, the Hon'ble Prime Minister said that the Central Government has continuously worked for the multi faceted development of Chhattisgarh and the results of that vision and those policies can be witnessed here today. He said that huge schemes are being implemented in Chhattisgarh in every field by the Central Government and the foundation stones of new projects are being laid. He also mentioned the various important national highways presented to the state. 'Today, a new chapter is being written in the development of Chhattisgarh's railway networks', the Hon'ble Prime Minister remarked as he mentioned that the improved rail network will reduce the congestion in Jharsuguda Bilaspur section of the Bilaspur-Mumbai rail line. Similarly, the other railway lines that are being started and the rail corridors that are being built will give new heights to the industrial development of Chhattisgarh, he said. He said that upon completion, these routes will not only provide convenience to the people of Chhattisgarh but will also create new employment and income opportunities in the region.

The Hon'ble Prime Minister highlighted that the cost and time of transporting coal from coalfields to power plants will be reduced. He also touched upon the inauguration of the 65 km Merry-Go-Round project to connect the Talaipalli Mine and said that the number of such projects will only increase in the country and states like Chhattisgarh will benefit the most in the times to come.

Minister of State for Tribal Affairs, Smt Renuka Singh Saruta and Deputy Chief Minister of Chhattisgarh, Shri T S Singhdeo were present on the occasion among others.

Background

The Hon'ble Prime Minister's emphasis on improving connectivity across the country will get a boost with the dedication to the nation of important rail sector projects worth around ₹6,350 crores in the public programme in Raigarh. The projects include Chhattisgarh East Rail Project Phase-I, 3rd rail line between Champa to Jamga, 3rd rail line between Pendra Road to Anuppur and MGR (Merry-Go-Round) system connecting Talaipalli Coal Mine to NTPC Lara Super Thermal Power Station (STPS). The rail projects will provide impetus to socioeconomic development by facilitating the movement of passengers as well as freight traffic in the region.

Chhattisgarh East Rail Project Phase-I is being developed under the ambitious PM Gati Shakti - National Master Plan for multi-modal connectivity and consists of a 124.8 km rail line from Kharsia to Dharamjaygarh including a spur line to Gare-Pelma and 3 feeder lines connecting Chhal, Baroud, Durgapur and other coal mines. The rail line, built at a cost of around ₹3,055 cr. is equipped with electrified broad gauge level crossings and free part double line with passenger amenities. It will provide rail connectivity for coal transportation from Mand-Raigarh coal fields located in Raigarh, Chhattisgarh.

The third rail line between Pendra Road to Anuppur is 50 km long and is built at a cost of about ₹516 cr. The 98-km-long third line between Champa and Jamga rail section is built at a cost of about ₹796 cr. The new rail lines will improve connectivity in the region and lead to an increase in both tourism and employment opportunities.

The 65-km-long electrified MGR (Merry-Go-Round) system will deliver low-cost, high-grade coal from NTPC's Talaipalli coal mine to 1600 MW NTPC Lara Super Thermal Power Station in Chhattisgarh. This will boost the generation of low-cost and reliable power from NTPC Lara, thus strengthening the energy security of the country. The MGR system, built at a cost of more than ₹2,070 cr., is a technological marvel for improving coal transportation from coal mines to power stations.

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Gati Shakti Vishwavidyalaya, Vadodara and Airbus Signed MoU for Aerospace Teaching and Research



In the presence of Shri Ashwini Vaishnaw, Minister of Railways, Smt. Jaya Varma Sinha, Chairman and CEO, Railway Board, Ms. Anjali Goyal, Member Finance and senior officials an MoU was signed at Rail Bhawan between Mr. Rémi Maillard (President and Managing Director, Airbus India and South Asia) and Prof. Manoj Choudhary (Vice-Chancellor, Gati Shakti Vishwavidyalaya)

An MoU (Memorandum of Understanding) was signed on 7th September, 2023 at Rail Bhawan, New Delhi between Mr. Rémi Maillard (President and Managing Director, Airbus India and South Asia) and Prof. Manoj Choudhary (Vice-Chancellor, Gati Shakti Vishwavidyalaya). The MoU was signed in the presence of Shri Ashwini Vaishnaw, Minister of Railways who is also the first Chancellor of Gati Shakti Vishwavidyalaya. Ms. Jaya Varma Sinha, the Chairman and CEO, Railway Board and senior officials of the Railway Board were present on the occasion.

Airbus and Tata had recently announced a partnership to design, innovate, make, manufacture and develop in India C295 aircraft facility at Vadodara (Gujarat). Airbus is the world's largest manufacturer of commercial aircraft and a leading producer of helicopters, defence and space equipment. The company has a long-standing relationship of symbiotic growth with India. The company recognises India as a key driver of global aviation as well as an indispensable talent and resource hub and is committed to maturing all the necessary building blocks to develop a fully integrated aerospace ecosystem in the country. Make in India is at the heart of Airbus' business strategy in India and the company is steadily increasing India's contribution to its global products.

Speaking on the occasion, Shri Ashwini Vaishnaw said, 'GSV will focus on intense industry—academia partnerships. All its courses will be designed in collaboration with industry. The students who study at GSV will be industry ready. They will be highly sought after for employment in transportation and logistics sectors. The MoU with Airbus is a significant step in achieving this goal.'

Speaking at the event, Mr. Rémi Maillard, President and Managing Director, Airbus India and South Asia, said, 'As a company that is committed to developing the aerospace ecosystem in India, we realise our responsibility to invest in human capital development. The partnership with Gati Shakti Vishwavidyalaya will develop a strong pipeline of skilled workforce in the country that will be future ready to serve its fast-growing aerospace sector.'

This industry-academic partnership will enable co-development and co-delivery of sector-relevant skilling courses and programs for regular students and working professionals, joint research and industry experiences for faculty, internships and placements for students and scholarship programs. It will create

job opportunities for students as per the industry requirements. It is expected that 15,000 students are likely to be placed in Airbus Indian operations.

Gati Shakti Vishwavidyalaya (GSV), Vadodara was established through an Act of Parliament in 2022, for creating best in class manpower and talent for the entire transportation and logistics sectors. This Central University is sponsored by the Ministry of Railways, Govt. of India and has Shri Ashwini Vaishnaw, Minister of Railways, Communications, Electronics and IT as its first Chancellor. Focusing exclusively on transport and logistics sectors, GSV is a 'first of its kind' university aiming to fulfil the mandate of the National Developmental Plans (PM Gati Shakti National Master Plan 2021 and National Logistics Policy 2022) across railways, shipping, ports, highways, roads, waterways and aviation etc. Following a demand-driven curriculum and leveraging state of the art infrastructure of all the Centralized Training Institutes of Indian Railways, the GSV shall create a resource pool of professionals across technology, economics, management and policy comprising multidisciplinary teaching (bachelors/masters/doctoral), executive training and research. GSV shall also undertake trainings for Indian Railways probationers and serving officers.

Being an industry-driven and innovation-led university, GSV already has several collaborations with leading institutions and industries across the world.

Minister of Railways Conducted Inspection of Nimach–Ratlam–Nagda Section



Minister of Railways, Shri Ashwini Vaishnaw imade digital payment at 'One Station One Product' stall at Nimach station (left) and also inspected a catering stall

Shri Ashwini Vaishnaw, Minister of Railways on 5th September, 2023 conducted the inspection of the passenger related amenities and facilities at Nimach station. During the inspection, Shri Sudheer Gupta, MP of Mandsour was also present and were accompanied by Shri Ashok Kumar Misra, General Manager of Western Railway and other senior officials from Headquarters and Division. MR also conducted window trailing inspection of Nimach — Ratlam–Nagda section.

He visited the 'One Station One Product' stall at the station and checked the quality of the products as well as enquired about its sales. Shri Vaishnaw urged the stall vendors to promote digital payments and realize the dream of 'Digital India'. He himself led the efforts by making digital payments of the products purchased from the OSOP stall and a catering stall at Nimach.

Shri Vaishnaw inspected the ongoing work of the new Road Over Bridge being constructed in lieu of Level Crossing (LC) No. 141 near Piplia Mandi station on the Nimach — Ratlam section. MR also interacted with the young officers of the Railways and called upon them to play an important role in the development of the Railways. He encouraged them to put in their best efforts and make significant contributions in the overall development of Railways which will in turn help to attain the dream of making India a developed nation by 2047 come true.

At Ratlam station, Shri Vaishnaw extended best wishes to the devotees travelling to Puri by the Mukhya Mantri Teerth Darshan Scheme train, for a memorable and happy journey.

39th RPF Raising Day Celebrated at Zonal RPF Training Centre, Hyderabad



Minister of State of Railways, Shri. Raosaheb Patil Danve, presented the medals to the RPF personnels. Shri. Manoj Yadava, DG, RPF was also present on this occasion

The Railway Protection Force (RPF) celebrated 39th Raising Day on 23rd September, 2023 by organizing a parade at the central level at RPF Training Centre, Moula-Ali, Hyderabad. Shri. Raosaheb Patil Danve, Minister of State of Railways graced the occasion as the chief guest. Shri. Manoj Yadava, Director General, RPF, New Delhi, Shri Arun Kumar Jain, General Manager, South Central Railway, Shri Anjani Kumar, Director General of Police, Telangana, senior officers and other eminent dignitaries also participated in the occasion.

The Minister of State of Railways presented the 'President's Police Medal for Distinguished Service', 'Indian Police Medal for Meritorious Service', 'Jeevan Raksha Padak' and various other medals to 42 RPF personnel.

The Director General of RPF outlined the various new initiatives taken by the force to provide a safe and secure train travel to the passengers. The DG inaugurated Cyber Cell class room at Training Centre, renovated Security Conference Hall, and RFID based Armoury management system.

MoSR held a Joint Meeting with Western and Central Railways

Minister of State for Railways, Smt. Darshana Jardosh chaired a joint meeting with senior railway officials of Western and Central Railways at Western Railway Headquarters at Churchgate, Mumbai on 13th September, 2023. Shri Ashok Kumar Misra, General Manager of WR and Shri Naresh Lalwani, General Manager of CR were also present on the occasion.

MoSR Smt. Darshana Jardosh was briefed about the latest developments, infrastructure projects, train related information, etc. by senior railway officers of both Western and Central Railways. Smt. Jardosh took stock of several infrastructure projects such as Udhna–Surat Third Line, Ujjain–Dewas–Indore Doubling, Rau–Dr. Ambedkar Nagar Doubling, Chhota Udepur–Dhar New Line, Rajkot–Kanalus Doubling, Palanpur–Mahesana Doubling, Bhuj–Naliya Gauge Conversion, etc. Smt. Jardosh also awarded WR's Rajkot Division and Mumbai and Nagpur Divisions of CR for excellent freight loading performance in the current year upto July 2023.



Minister of State for Railways, Smt. Darshana Jardosh chaired a joint meeting with Shri Ashok Kumar Misra, GM/WR and Shri Naresh Lalwani, GM/CR

MoSR Flagged Off the Inaugural Run of Vadodara – Dahod MEMU

Smt. Darshana Jardosh, Minister of State for Railways flagged off the inaugural trip of the new Vadodara – Dahod MEMU on 26th September, 2023 from Vadodara station. On this occasion, Mayor of Vadodara City, Smt Pinkiben Neerajbhai Soni, MP, Smt Ranjanaben Bhatt and MLA, Shri Keyurbhai Narayandas Rokadia were also present alongwith senior railway officers. Smt. Darshana Jardosh, in her address appreciated the efforts made by Western Railway to start this new train which is the third MEMU service on this route. She stated that this new train will provide better connectivity between Vadodara and Dahod.



Minister of State for Railways, Smt. Darshana Jardosh flagged off the inaugural trip of Vadodara – Dahod MEMU train (right) and also addressed the gathering (left)

At Dahod railway station, MP of Dahod, Shri Jaswantsinh Bhabhor welcomed the inaugural service of the train. The newly introduced MEMU train is a three-phase train equipped with regenerative power technology. This train has modern facilities like CCTV cameras, digital passenger information system, etc. The coaches of the train are equipped with modern air spring technology which provides better riding comfort during the journey. The train can accommodate around 2,800 passengers.

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Ministry of Railways Celebrated 'Swachhata Pakhwada-2023'



Smt. Jaya Varma Sinha, Chairman & CEO, Railway Board administered Swachhata Pledge on the occasoin of Swachhata Pakhwada. Also seen are Ms. Anjali Goyal, Member (Finance), Shri Naveen Gulati, Member (T&RS) and Shri Roop Narayn Sunkar, Member (Infrastructure)

Swachhata Pakhwada–2023 was inaugurated by Smt. Jaya Varma Sinha, Chairman & CEO, Railway Board on 15th September, 2023 by administrating Swachhata Pledge in Rail Bhawan. Swachhata Pledge was administered to entire Railway family which included employees of Railways along with senior officials of Railway Zones and Divisions connected via video conferencing. Ministry of Railways observed Swachhata Pakhwada from 16th to 30th September 2023. Ministry of Railways extended it suo-moto up to 2nd October, 2023 and it was culminated with Mahatama Gandhi's Jayanti. Swachhata Pakhwada awards have been provided to each ministry by Ministry of Jal Shakti (nodal Ministry) for exemplary performance during pakhwada period. Previous year Swachhata Pakhwada–2022 awards have been given to the following zonal railways:

- 1st position: South Western Railway;
- 2nd position: Western Railway;
- 3rd position: North Eastern Railway.

Indian Railways is an environment friendly means of bulk transportation and it has always been in the forefront of promoting clean and green environment.



Furthering the spirit of Swachh Bharat, Nukkad Natak and awareness march has been carried out across stations of Indian Railways in order to spread awareness of cleanliness and hygiene among the public.



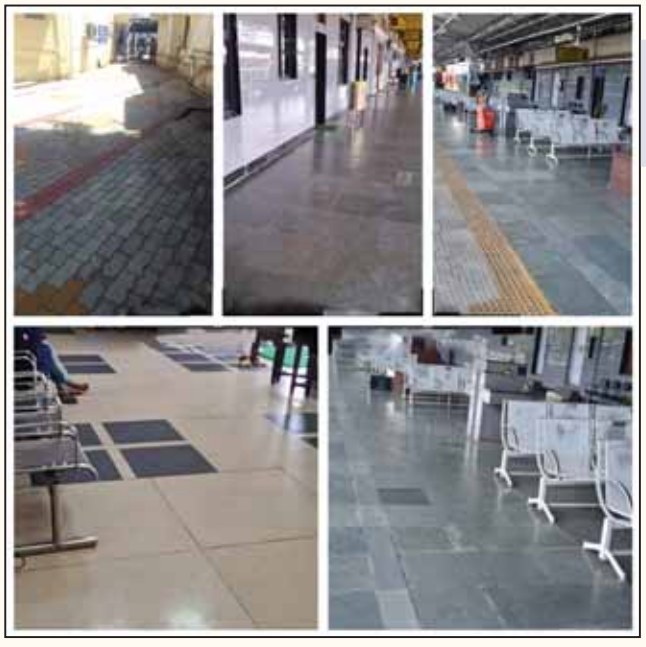
Dr. M.G. Ramachandran Central Railway Station, Chennai gleamed with impeccably clean tracks on the occasion of Swachhata Pakhwada, 2023.



Shri Mata Vaishno Devi Katra Station, upheld clean station standards owing to consistent and concerted efforts during Swachhta Pakhwada



Nukkad Natak was performed at Chennai Egmore Railway Station of Tamil Nadu with the keen participation of Scouts and Guides which promoted the message of Swachhta Pakhwada Campaign.



Tiruchchirappalli Railway Station of Tamil Nadu gleamed spotlessly with collective effort during Swachhata Pakhwada 2023.



Swachh Patri - intensive cleaning drive on tracks and yard areas under Secunderabad Station

Minister of Rural Development and Panchayati Raj Inaugurated the New Stoppage of Train at Bachhwara

Shri Giriraj Singh, Minister of Rural Development and Panchayati Raj and Prof. Rakesh Sinha, MP on 3rd September, 2023 inaugurated stoppage of 13206/05 Saharsa-Patliputra-Saharsa Janhit Express at Bachhwara Junction of Sonpur Division.



MP of Machhlishahr, Inaugurated the New Stoppage of Trains at Kerakat Station



Member of Parliament, Machhlishahr, Shri B.P. Saroj inaugurated the new stoppage of train number 15231 Barauni–Gondia Express on experimental basis at Kerakat station of Varanasi division over NER on 18th August, 2023 by flagging off the train at a function organized at Kerakat station.

New Stoppage of Trains Inaugurated by MP, Maharajganj from Ekma Station

Member of Parliament, Maharajganj (Bihar) Shri Janardan Singh Sigriwal inaugurated the new stoppage of train number 14617 Banmankhi-Amritsar Jansewa Express on experimental basis at Ekma station of Varanasi division over NER on 9th September, 2023 by flagging off the train at a function organized at Ekma station. He also inaugurated the new stoppage of train number 15113 Gomti Nagar–Chhapra Kacheri Express on experimental basis at Rajapatti station of Varanasi division over NER on 14th September, 2023 by flagging off the train at a function organized at Ekma station.



MP of Ballari and Koppal Flagged Off Extension of Two Trains

Shri Y. Devendrappa, MP, Ballari and Shri Karadi Sanganna, MP, Koppal flagged off the extension of Train No. 11139/11140 Chhatrapati Shivaji Maharaj Terminus, Mumbai–Gadag – Chhatrapati Shivaji Maharaj Terminus, Mumbai Express and Train No. 11305/11306 Solapur–Gadag–Solapur Express up to Hosapete from Hosapete on 29th August, 2023 in the presence of other dignitaries of the region.



Coaches of Guwahati–Barmer Express Converted into LHB Coaches and Flagged Off



The coaches of Train No. 15632/15631 Guwahati–Barmer–Guwahati weekly express has been converted into modern LHB (Linke Hofmann Busch) coaches, equipped with the-state-of-art features. Smt. Queen Oja, MP (Lok Sabha) flagged off the train with LHB rake from Guwahati Railway Station on 31st August, 2023. Senior railway officials from Headquarter and Division and other dignitaries were present on the occasion. Indian Railways has been continuously striving to provide a safer, faster and more comfortable travelling experience to the people of the North Eastern region, and the conversion of the Guwahati Barmer — Guwahati Express into a modern LHB rake will be an important step in this regard.

Additional Stoppage of Guwahati-Ranchi-Guwahati Special Train at Bagdogra Flagged Off

Shri Raju Bista, MP (LS) of Darjeeling flagged off the 05671/05672 (Guwahati–Ranchi –Guwahati) special with additional stoppage at Bagdogra station on 11th September, 2023. Shri Anandamay Barman, MLA and senior N.F. Railway officials were also present on the occasion.



Extension of Express Train between Silchar and Guwahati upto Rangiya Flagged Off



For the convenience of the passengers, the services of tri-weekly train no. 15612/15611 (Silchar–Guwahati–Silchar) Expess upto Rangiya in both directions w.e.f. 4th September, 2023 has been extended. Shri Bhubaneswar Kalita, MP (Rajya Sabha); Shri Dilip Saikia, MP (Lok Sabha) and Shri Bhabesh Kalita, MLA/ Rangiya flagged off the train from Rangiya Railway station on 4th September, 2023. Senior railway officials from Headquarter and Division and other dignitaries were present on the occasion. This extension will serve the purpose of passengers who travel frequently from Cachar area to lower Assam for different works. The people of Cachar area will also have the advantage of travelling to north bank of Brahmaputra via Rangiya Jn.

Guna-Bina MEMU Train Inaugurated by MP Guna

MP Guna, Dr. Krishna Pal Singh Yadav flagged off the inaugural service of train no. 06608 Guna-Bina MEMU special train at Guna Railway station on 28th August, 2023. On this occasion, MLA Guna, Shri Gopilal Jatav and other dignitaries, media representatives, senior railway officers and employees were present. This train reached Bina station after halting at Maban, Pagara, Pilighat, Shadhoragaon, Ratikheda, Ashoknagar, Hinotia Pipalkheda, Orr, Rehatwas, Piprai Gaon, Guneru Bamori, Mungaoli, Kanjiya, Semarkhedi and Mahadeokhedi stations.



MP of Karauli–Dholpur Inaugurated the New Stoppage of Trains at Shri Mahavirji Station



Ministry of Railways has provided a 2 minute halt of train no. 19037/19038 and train no. 20941/20942 at Shri Mahavirji station on a trial basis for six months in both directions. On the arrival of train no. 20941 Bandra Terminal-Ghazipur City Express and train no. 19037 Bandra Terminal-Barauni on the first day of stoppage at Shri Mahavirji Station, MP Karauli-Dholpur Dr. Manoj Rajoria, along with public representatives and passengers flagged off the train.

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Kavach Testing Building Launched at Kota, West Central Railway



On 31st August, 2023 Shri Arun Saxena, Advisor to the Minister of Railways, launched the setting up of Kavach Factory Acceptance Testing Room at Kota for the first time over West Central Railway. One stationary Kavach and two loco Kavach were installed. This modern technology will give special strength to Kavach testing. Kota Division thus had to go to Secunderabad, in the east for the modern test. A total of 46 towers have been installed in Kota Division so far and loco trials of Kavach have been carried out under various conditions in different sections. The Kavach provides a reliable protective layer in the rail operating system. After its implementation, accidents caused by safety lapses due to human error by Loco Pilots ignoring the signal will be eliminated forever.

Shri Sachin Shukla, CSTE (Project, GSU, Shri Rahul Jareda Dy CSTE, GSU, Kota, Shri R. R. Meena Sr. DSTE (Co), Kota and other officials were present during the inauguration of the Kavach Factory Acceptance Testing Room.

Director General, Railway Protection Force Visited Hubballi

Shri Manoj Yadava IPS, who took over as Director General (RPF) visited Hubballi on 14th September, 2023. He inaugurated a 12 bedded newly constructed RPF barrack at Gadag which was constructed at a cost of ₹71 lakh for the accommodation of RPF staff. DG/RPF chaired Suraksha Sammelan at Rail Soudha which was attended by 120 officers and staff of RPF/South Western Railway. He also participated in a meeting with GM, Shri Sanjeev Kishore and PHoDs wherein various issues related to RPF and security in railways were discussed. He lauded the performance of SWR in rising to first place in terms of KPI (key performance indices).



KIND ATTENTION

AUTHORS/WRITERS contributing articles for the magazine are requested to restrict their articles to a reasonable size. Ideally an article should not exceed 1000 WORDS.

In view of the space constraints of the magazine, sometimes it becomes difficult to include longer articles. All are requested to appreciate our problem and co-operate.

Kolkata Metro Railway is Set to Become Member of Elite Club of London, Moscow, Berlin, Munich and Istanbul Metro

Indian Railways' Kolkata Metro plans to replace steel Third Rail with composite aluminium Third Rail. Total 35 km mainline steel Third Rail shall be replaced in stages. It will result in huge savings in traction energy costs like a straight saving of ₹210 cr. capital investment for 35 km of Metro corridor.

Kolkata Metro Railway, India's first Metro built by Indian Railways on 24th October, 1984 has been serving as a lifeline for Kolkata, the City of Joy for nearly 40 long years.

In Kolkata Metro Railway, the power to Metro Rake is supplied to rolling stock at 750V DC through steel Third Rail. The Third Rail Current Collector (TRCC) made of steel fitted on metro rake collects the current from Third Rail. Kolkata Metro Railway using steel Third Rail for the last 40 years. Kolkata Metro Railway has now decided to use composite aluminium Third Rail in all the upcoming corridors being undertaken for construction along with retro fitment in existing corridor with steel Third Rail. With this Metro Railway, Kolkata would become the member of elite club of London, Moscow, Berlin, Munich and Istanbul Metro who have also shifted from steel Third Rail to aluminium Third Rail.

In this regard, Metro Railway Kolkata has floated a tender for replacement of existing Third Rail, in the first phase to cover the section between Dumdum to Shyambazar. In the second phase work would be taken up from Shyambazar to Central and J D Park to Tollygunge. In the third phase, the section between Mahanayak Uttam Kumar (Tollygunge) to Kavi Subhash (New Garia) shall be taken up. So, total 35 rkm main line steel Third Rail shall be replaced in stages.



The obvious advantages of aluminium composite Third Rail over steel Third Rail are as under:

- Reduction in resistive current loss and improved Traction voltage level as the resistance of steel Third Rail is around six times higher than composite aluminium Third Rail.
- On an average, for 10 km corridor with use of aluminium composite Third Rail would require one number less Traction Substation compared to steel Third Rail i.e. a straight saving of approx.₹210 cr. capital investment for a 35 km of Metro corridor.
- The reduced voltage drop shall facilitate achieving faster acceleration with the same rake available with Kolkata Metro Railway.
- Reduced maintenance and life cycle cost. The requirement of painting of Third Rail every 5 years may not be needed anymore. The frequency of measurement of Third Rail dimension may reduce significantly. There may be no possibility of damage due to rusting, etc.
- Improvement in the efficiency of train operations.
- Huge improvement in Energy Efficiency and reduction in carbon footprint.
- Estimated energy saving using composite aluminium Third Rail may be approximately 6.7 million units per annum.
- Improved headway of the trains.

Ministry of Railways Revised the Amount of ex-gratia Relief Paid to the Dependents of Dead and Injured Passengers Involved in Train Accidents and Untoward Incidents

Ministry of Railways has decided to revise the amount of ex-gratia relief to be paid to the dependents of dead and injured passengers involved in train accidents and untoward incidents as defined under Section 123 read with Section 124 and 124-A of the Railways Act, 1989 and to the road users who met with an accident due to Railway's prima facie liability at Manned Level Crossing Gate Accident. The revised rates and compiled instructions are as below:



Amount of Ex-gratia for Train Accidents, Untoward Incidents and Manned Level Crossing Gate Accidents

	Type of accident	Amount of ex-gratia for Death	Amount of ex-gratia for Grievous Injury	Amount of ex-gratia for Simple Injury
1.	Train Accident (as defined 1) under Section 124 of the Railways Act, 1989)	₹5,00,000/(Rupees Five lakh only)	₹2,50,000/ (Rupees Two lakh Fifty thousand only)	₹50,000/ (Rupees Fifty Thousand only)
2.	Untoward Incident (as defined under Section 124-A of the Railways Act, 1989)	₹1,50,000/ (Rupees One lakh Fifty Thousand only)	₹50,000/ (Rupees Fifty Thousand only)	₹5,000/ (Rupees Five Thousand only)
3.	Accident at Manned Level Crossing (due to Railway's prima facie liability)	₹5,00,000/ (Rupees Five lakh only)	₹2,50,000/ (Rupees Two lakh Fifty thousand only)	₹50,000/ (Rupees Fifty Thousand only)

Additional Ex-gratia relief in case of Hospitalization of Grievously Injured Passengers beyond 30 days

In case of Train Accident	In case of Untoward Incident
₹3,000/- per day to be released at the end of every 10 day period or date of discharge, whichever is earlier.	₹1,500/- per day to be released at the end of every 10 day period or date of discharge, whichever is earlier **upto further six month of hospitalization.**
	Thereafter, ₹750/- per day be released at the end of every 10 day period or date of discharge, whichever is earlier upto further five month of hospitalization.
(a) Lump sum amount of ex-gratia for hospitalization of grievously injured passenger upto first 30 days is as mentioned in table at para (1) above. (b) The maximum period for which ex-gratia is payable to the grievously injured passenger will be 12 months.	

This ex-gratia relief will be exclusively for passengers who are grievously injured in train accidents or untoward incidents as defined under Section 123, read with Section 124/124-A, of the Railways Act, 1989.

The period for treatment as indoor patient for more than 30 days would need to be certified by a Railway Doctor for the purpose of further ex-gratia payment upto the period of remaining 11 months. In case where the injured is taking treatment in other than Railway hospital, the treatment has to be certified by a Railway Doctor.

Maximum amount of upto ₹50,000/- to be paid in cash as an immediate relief for taking care of initial expenses. Remaining amount to be paid by Account Payee Cheque/RTGS/NEFT/Any other online payment mode. Railways may disburse the entire amount of ex-gratia/enhanced ex-gratia by Account Payee Cheque/RTGS/NEFT/any other online payment mode, if deemed appropriate.

No ex-gratia relief would be admissible to road users in case of accident at Unmanned Level Crossings, trespassers, persons electrocuted by OHE (Over Head Equipment). Ex-gratia payment in case of train accidents and untoward incidents are not to be taken into account at the time of final claim for compensation the amount of ex-gratia relief admissible to road users, who meet with an accident due to Railway's prima facie liability at Manned Level Crossing Gate Accident, will be counted towards the amount of compensation payable, if action is tenable against the Railways under the Law of Torts and an award is actually granted by Court of Law.

Ex-gratia payments should also be made to railway servants killed or injured by a moving train while performing their duty, for example, gang man working on track run over accidentally by a moving train. Payments should be sanctioned/arranged preferably on the spot by a Senior Scale Officer nominated by the General Manager after making such enquiries as, can be reasonably made on the spot after the immediate needs by way of medical attendance etc. to injured persons are attended to.

Food-loving Passengers Assemble





Continuing the initiative of providing a unique dining experience to passengers & locals, Necklace Road Railway Station of Telangana has incorporated 'Rail Coach Restaurant' offering a range of luscious dishes.

RailTel Delivered Integrated Telecom Solutions & Cyber Security Solutions for G20 Summit

The G20 Summit was held in New Delhi from 9th to 10th September, 2023. RailTel was entrusted with delivering integrated Telecom solutions at Pragati Maidan, specifically at the newly inaugurated Bharat Mandapam and exhibition halls.



Over 3,600 man-days were invested by RailTel and its partners to establish cutting-edge Mobile Network Infrastructure and a neutral In-building Telecom Infrastructure, substantially enhancing mobile coverage across the expansive 122-acre ITPO campus. This telecom infrastructure consists of 1675 indoor antennas, 300 access points, over 35 km of RF cable, and 25 km of fibre cable. As part of the project Wi–Fi infrastructure was strategically placed in outdoor corridors, covering the various halls slated for G20 events and the back-end IT infrastructure for Wi–Fi access has been seamlessly integrated with the indoor Wi–Fi infrastructure. RailTel has deployed a secure and robust telecom infrastructure, ensuring on demand wired Internet. RailTel also provided passive infra to Telcos.

RailTel provisioned Internet Bandwidth from two Internet Up-streams through 5 different physical paths. RailTel also deployed required cyber security solutions to secure network infrastructure, including secure configuration management, firewall deployment, and intrusion prevention systems to prevent unauthorized access and unauthorized activities within the event's network environment. RailTel coordinated with CDAC, CERT-IN, NIC and MHA, under the guidance of MEA, to deliver safe and resilient telecom solutions for G20. The entire project was supported by the Department of Telecom for ensuring closer coordination with mobile service providers. RailTel has also provided end-to-end bandwidth to integrate camera feeds from Bharat Mandapam, Rajghat area, New Delhi Parliament Street to the Delhi Police HQ (PHQ) at Jai Singh Marg.

RailTel took the challenge of bringing the entire telecom fraternity together to deliver a G20 project of very high complexity and scale and delivered the services successfully.

CLW Manufactured 250 Locos in 134 Working Days



Chittaranjan Locomotive Works produced as many as 250 electric locomotives in 134 working days, as against 183 days last year. This factory took up the challenge of manufacturing of 540 locomotives ordered by Railway Board against previous out turn of 436 locomotives in 2022-23. CLW set its priority and accelerated the manufacturing to 55 locomotives in June, 65 in July and 57 in August setting new records every month from 67 locomotives produced in first two months. The production of locomotives up to August is 244 which is 41% higher compared to 173 produced by same time previous year. The bogie assembly shop also had an excellent production of 200 bogies up to August against previous best of 144 bogies last year recording an increase of 38% over last year.

Ministry of Railways Allocated Kolkata Metro ₹6,000 cr. for 85 New Rakes



New futuristic rake design has been envisaged for Kolkata Metro. These new aesthetically designed AC rakes will be produced at ICF/Chennai and taking inspiration from Bengal's bridal and terracotta artwork these rakes will have nose cone design. In each coach of these rakes local arts and crafts will be highlighted and USB charging ports will be provided at two sides of each coach. The most unique feature of these rakes would be provision of standing seats at one corner where space is limited. Airport-bound commuters can also place their luggage beneath these seats. It will further improve the comfort level of Metro journey. For ensuring safety of passenger, anti-skid flooring and fire extinguishers will be provided along with unique grab handles and handle loops. In case of emergency, commuters will be able to interact with the motorman through Talk to Driver Unit and CCTV cameras will be strategically placed inside every coach to ensure maximum vigilance of the coach on real-time basis.

Keeping in mind the huge rush during peak hours, improved roof grab handles will be provided to encourage the passengers not to stand on the vestibules. Special digital display boards will also be installed inside the rakes for displaying infotainment materials. In order to create a warm ambience inside the coaches, special cove lighting will also be arranged. Robust guardrails and grab poles will be provided at the door entries and above the sitting benches inside the rake for the convenience of the commuters. In these new rakes, passengers will enjoy unobstructed entry/exit with conveniently and ergonomically placed holding positions.

Such futuristic rakes are expected to be included in Metro's fleet around 2026. Metro has envisaged a plan to induct 85 new rakes in phases in its fleet. As a result, present fleet of 46 rakes (32 Broad Gauge and 14 Standard Gauge) will be increased to 131 rakes (114 Broad Gauge and 17 Standard Gauge) to cater to the demand of present as well as all upcoming Corridors. For procurement of these rakes, ₹6,000 cr. has already been sanctioned by Ministry of Railways.

Battery Energy Storage System to be Installed in North-South Metro

Metro Railway is going to install Battery Energy Storage System (BESS) at four strategic locations along the entire stretches of North-South Metro Corridor. This new system, an amalgamation of inverters and Advance Chemistry Cell (ACC) Batteries, is capable of doing wonders in case of sudden power cuts or grid failure and will be installed at Noapara, Shyambazar, Central and Jatin Das Park substations. One of the most significant features of this unit is that it can be used to haul stranded trains at 15-20 km/hr speed from mid-tunnel to the next station in case of any power failure or even National Grid Failure.



Northeast Frontier Railway Bagged PMI South Asia Award

Northeast Frontier Railway has bagged the PMI South Asia award for Micro Project of the Year with its entry "Intrusion Detection System for saving elephant lives". N. F. Railway received the award in a ceremony held at Chennai on 2nd September, 2023. This is for the first time ever that any zonal railway under the Ministry of Railways has bagged this award since its inception in 2009.





Many reputed organisations participate in this prestigious annual award every year showcasing their innovations. PMI South Asia Awards Program is being awarded as a recognition for the project management community in the region. Intrusion Detection System (IDS) is an eco-sustainable solution to protect elephants and improve mobility in train operations. The system is based on Artificial Intelligence (AI) and existing optical fibres will be used as sensors to identify movements of wild animals at locations and alert control offices, station masters, gateman and loco pilots. The AI based software can monitor unusual movements up to 40 km on either side of the main unit (i.e total stretch of 80 km). In addition to it the IDS will also help in detecting rail fracture, trespassing on railway track and alert about disaster mitigation.

'Make in India' Solutions Through HSRIC in the Field of High Speed Railway System



The HSR Innovation Centre (HSRIC) under the aegis of National High–speed Rail corporation, has undertaken several collaborative research projects with various IITs and IISc for development of indigenous solutions for Railway domain especially High-Speed Railway. The 6th Advisory Council meeting of HSRIC held on 14th September, 2023, under the leadership of Shri Rajendra Prasad, Managing Director along with NHSRCL Directors and senior officers, President, Railway Technical Research Institute (Japan), faculty from The University of Tokyo, Directors from IIT Delhi, IIT Mumbai, IIT Kanpur, IIT Gandhinagar, IIT Madras, IIT Roorkee and IIT Tirupati, IIT Kharagpur, to review the ongoing projects.

Ongoing projects are related to civil engineering domain like Design of Reinforced Earth Structures for HSR and Railway applications, detailed study on CAM for High–speed Railway track, Optimization of High–speed Railway viaduct design and Electrical domain, etc. Apart from development, several technical papers have been published in the field of Traction Power Supply System and Dynamic Interaction of Pantograph and Catenary under the aegis of HSRIC by IITD and IISc and IITB teams.

South Central Railway Bagged Three Energy Efficiency Unit Awards



South Central Railway has received three Energy Efficient Unit Awards in favour of three administrative units of the zone from Confederation of Indian Industry (CII) at the 24th National Awards for Excellence in Energy Management–2023. These awards are declared for the best energy management practices during the year 2023. These awards were received by the representatives of the respective units.

- Lekha Bhavan (SCR Accounts Building) at Secunderabad has been awarded with Excellent Energy Efficient Unit in Building sector.
- Rail Nilayam (SCR HQ Building) at Secunderabad.
- Zonal Railway Training Institute (ZRTI) at Moulali were awarded as Energy Efficient units in buildings sector.

16th All India RPF Dog Competition Organized in North Central Railway

Railway Protection Force, North Central Railway has successfully organized the 16th All India RPF Dog Competition from 8th to 10th September, 2023. Selected canine teams from 16 Zonal Railways participated in the event. Shri Satish Kumar, General Manager, NCR was the chief guest. In the tracking event, 'Jansi' of SR secured the first place followed by 'Axcel' of NR and 'Sultan' of SCR. In the narcotics detection event, 'Rambo' of SWR secured the first place followed by 'Inch' of WR and 'Duke' of ER. In the Explosive Detection event, 'Bravo' of East Central Railway secured the first place followed by 'Remo' of SCR and 'Anex' of Northern Railway.



READERS
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Vijayawada Railway Station Awarded Platinum Rating by Indian Green Building Council

Vijayawada Railway station has earned the distinction of being awarded the highest 'Platinum Rating' Certification as Green Railway station by the Indian Green Building Council (IGBC). The rating takes Vijayawada Railway station to the highest standard of platinum rating for Green Railway Stations. Earlier, Vijayawada Railway Station was holding the gold rating from IGBC–CII and has now moved up the ladder to attain the highest norm of Platinum Certification.



The IGBC, with the support of Environment Directorate of Indian Railways has developed the Green Railway Stations rating system to facilitate adoption of Green Concepts, thereby reducing the adverse environmental impacts due to station operation and maintenance and enhance the overall commuter experience. The rating system helps to address National priorities like water conservation, handling of waste, energy efficiency, reduced used of fossil fuel, lesser dependency on usage of virgin materials and health and well being of occupants. The six modules involved in the task are – health, sustainable station facility, hygiene and sanitation, energy efficiency, water efficiency, smart and green initiative, innovation and development.

Features of Vijayawada station that led to Platinum Green Rating:

- Effective implementation of passenger amenities. Complaint and feedback mechanism which include web based complaints, SMS–based complaints, IVRS feedback system and MIS report.
- Health and hygeine standards like safe drinking water, etc.
- Energy efficient measures like five star rating electrical equipments, LED fixtures, BLDC fans, etc.
- Smart and green initiatives like Wi-Fi facility, smart card ticketing, etc.
- Innovative measures like CAMTECH design coach watering, etc.

Shri Arun Kumar Jain, General Manager, South Central Railway congratulated Vijayawada Division officials on achieving the highest Green certification from IGBC for Vijayawada Station.

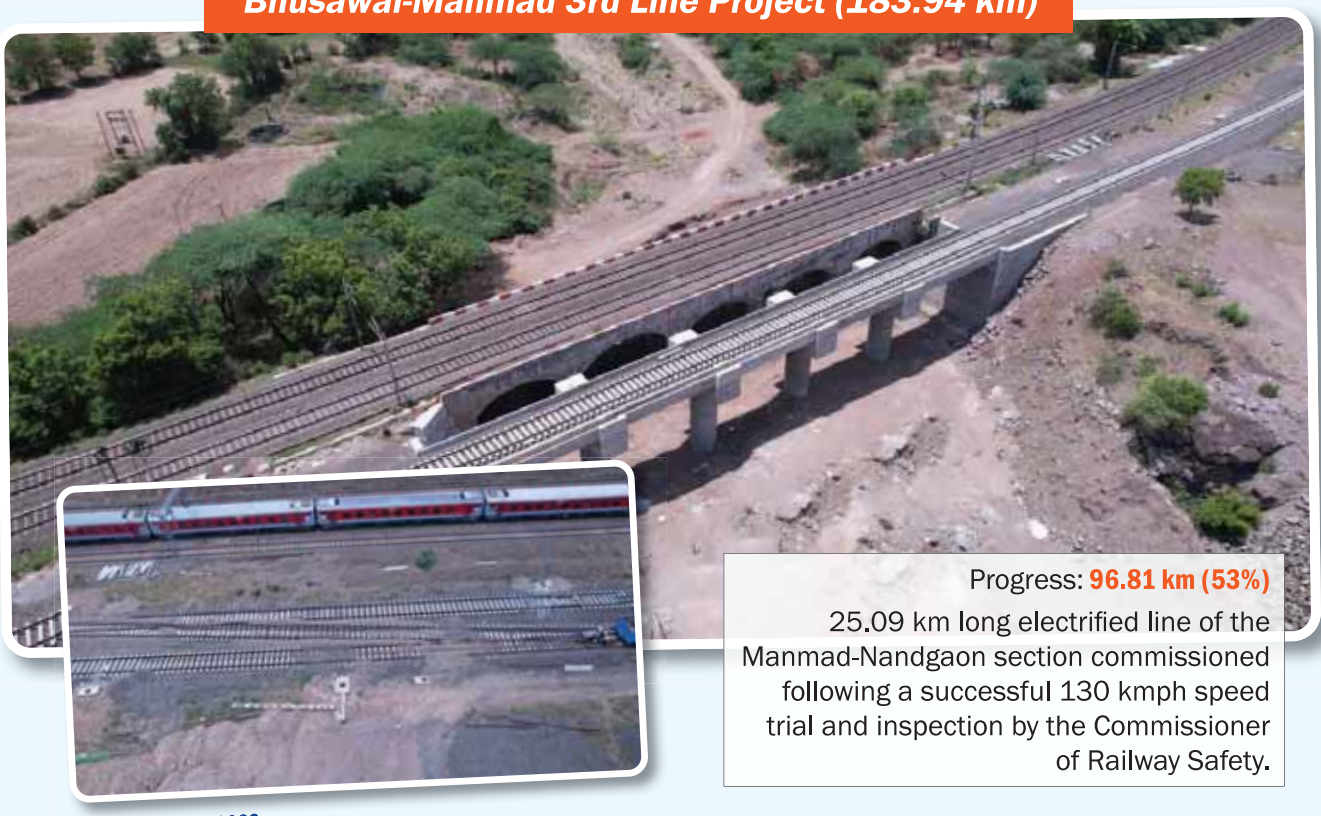
High Level Delegation of Angola Railways Visited BLW



Officials of M/s RITES with two-member delegation of CFM Angola Railways visited various shops on 15th September, 2023 to see the diesel and electric locomotive manufacturing facilities at Banaras Locomotive Works. On this occasion, a high level meeting of senior officials of BLW with the representatives of Angola and RITES officials was held in the Hall of Fame of the Administration Building, in which Principal Chief Mechanical Engineer Shree P.K.Saha, Principal Chief Electrical Engineer Shree S.K.Srivastiva and other senior officers were present.

Progress Report

Bhusawal-Manmad 3rd Line Project (183.94 km)



Progress: **96.81 km (53%)**

25.09 km long electrified line of the Manmad-Nandgaon section commissioned following a successful 130 kmph speed trial and inspection by the Commissioner of Railway Safety.

29th August, 2023

Vanchi Maniyachhi - Nagercoil Doubling Project (102 km)

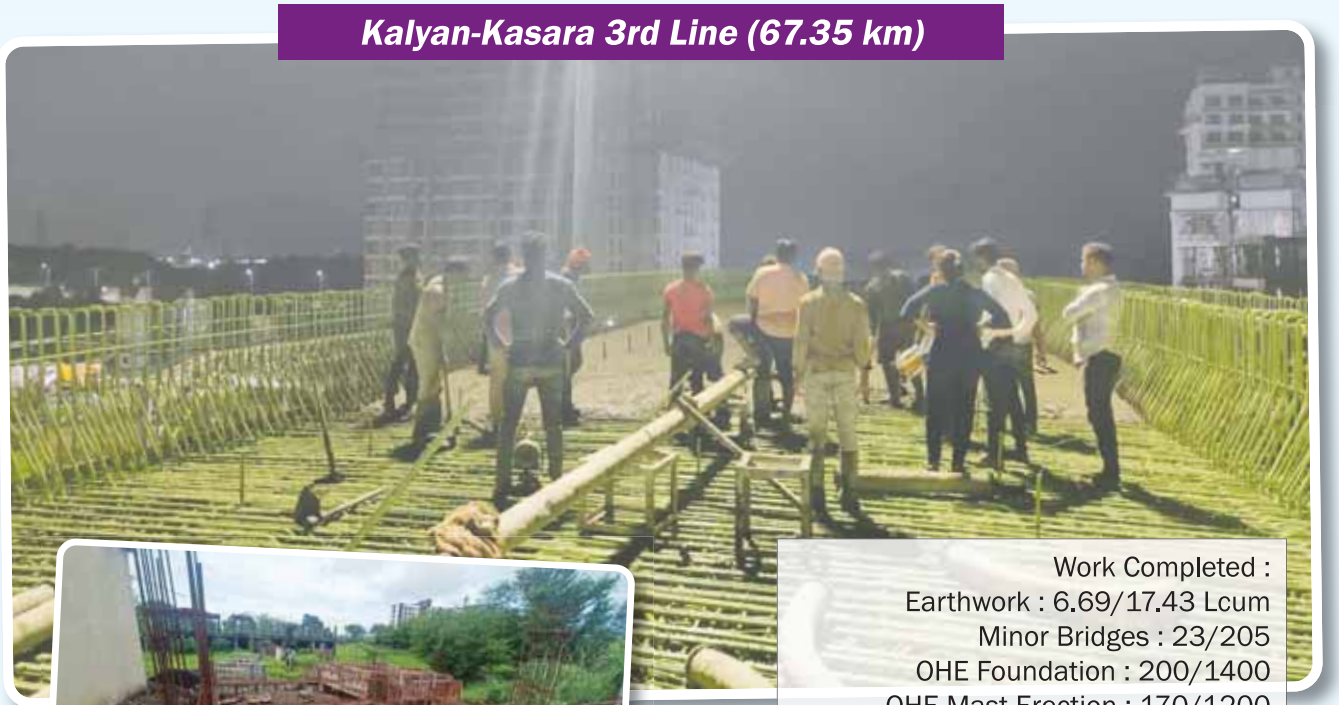


Progress: **84% Completed (85.69 km)**

It will reduce the travel time between Chennai to Nagercoil, Kanniyakumari and other towns in Southern part of Tamil Nadu.

1st September, 2023

Kalyan-Kasara 3rd Line (67.35 km)





19th September, 2023

Work Completed :
Earthwork : 6.69/17.43 Lcum
Minor Bridges : 23/205
OHE Foundation : 200/1400
OHE Mast Erection : 170/1200
Progress Work : Major Bridges : 5/9
Boost train mobility and ease congestion in Kalyan-Kasara section

Mathura-Jhansi 3rd Line Project (274 km)



Progress: **122 km Completed**

By directly connecting trains bound to Southern and Central India to Delhi it will boost trade and commerce for the local populace.



3rd September, 2023

INDIAN

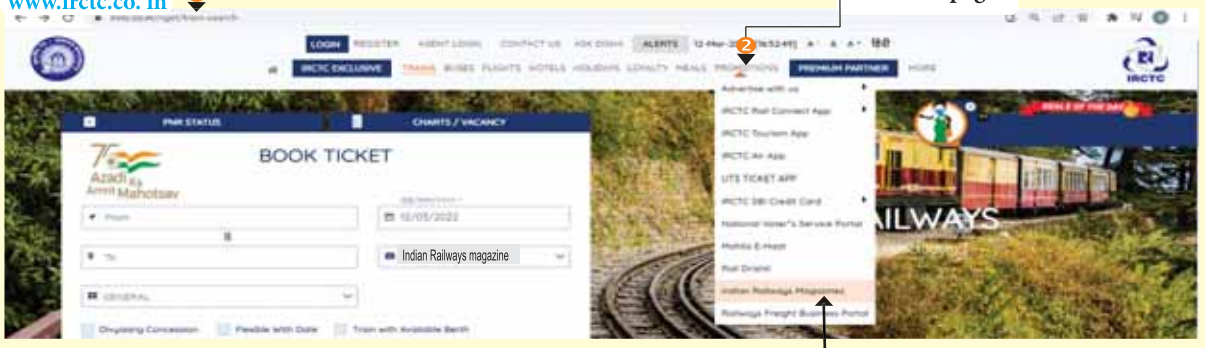
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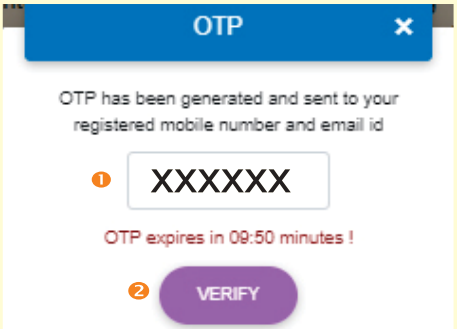
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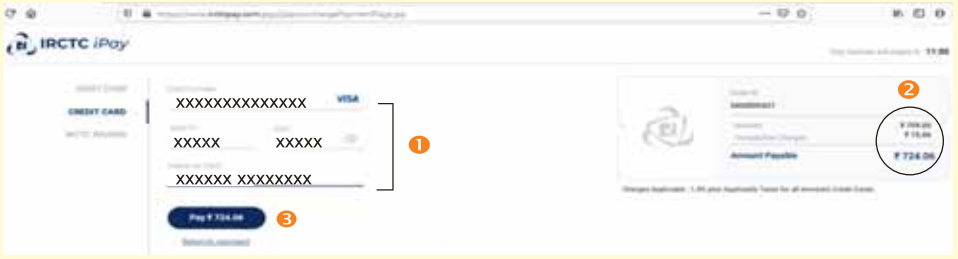
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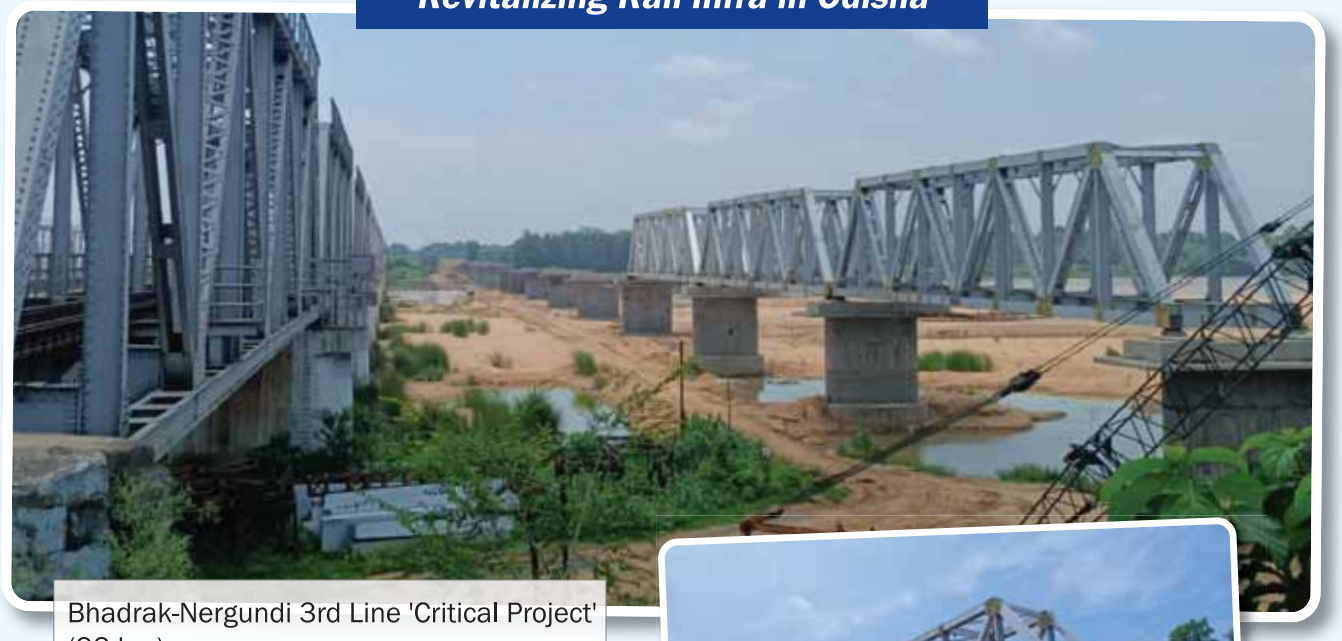
Work of Charlapalli Railway Station to be Developed as a Satellite Coaching Terminal is in Full Swing.



With pioneering facilities, this terminal will aid high traffic demand and improve connectivity of the twin cities, Hyderabad and Secunderabad in Telangana

4th September, 2023

Revitalizing Rail Infra in Odisha



Bhadrak-Nergundi 3rd Line 'Critical Project' (92 km)

Progress: **25.3 km Commissioned**

It will enhance transportation accessibility, propel trade and commerce opportunities for the locals.



1st September, 2023

Nagpur Station Redevelopment work

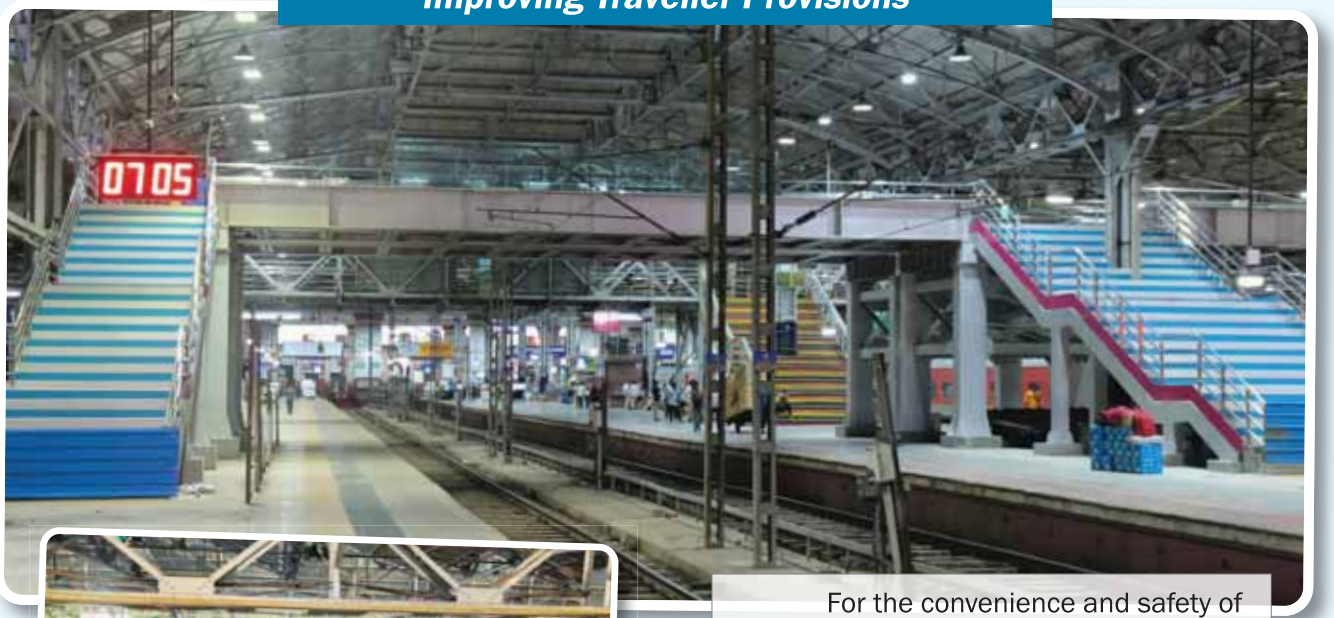


Work Completed:
Soil investigation
Batching plant
Wheel–washing plant
Station's essential modernisation will cater to a greater number of passengers enhancing ease, comfort and accessibility for all.



9th September, 2023

Improving Traveller Provisions





10th September, 2023

For the convenience and safety of commuters, a new Foot Over Bridge (FOB) has been commissioned at Mumbai Central Railway Station, connecting the station's mainline platform.

Upgrading Rail Infra in Andhra Pradesh
Vijayawada-Gudur 3rd Line (287.67 km)



Progress: **171 km commissioned**

Reinforce connectivity between Northern and Eastern parts of the Country with Southern states.

Boost trade and commerce in the region

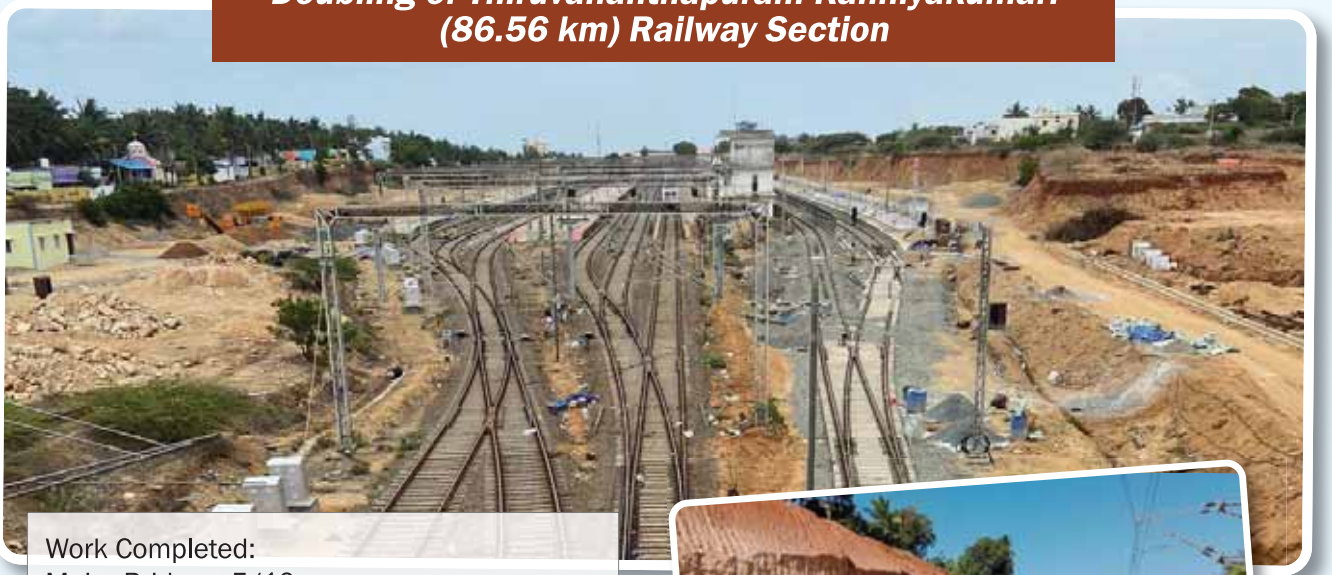
11th September, 2023

New 1600 KVA Sub-station has been Commissioned for Pune Jn. in place of the existing 11 KV Substations at PRS and goods shed that had a combined capacity of 800 KVA.



12th September, 2023

Doubling of Thiruvananthapuram-Kanniyakumari (86.56 km) Railway Section



Work Completed:
Major Bridges: 5/10
Minor Bridge: 87/303
Earthwork & Blanketing: 11.17/54.44 Lcum
-20% S&T work done
Increasing train operations via Nagercoil and Madurai Jn. and drive economic growth.



15th September, 2023

Transformation of Hadapsar Railway Station as a Satellite Terminal of Pune





18th September, 2023

Work Completed: Platform extension: 24 coach length

Work in Progress:

800 m platform shed underway, Public announcement system, Enquiry counters, TTE, RPF, GRP office and rest room

Indian Railways Men's Handball team won 2nd place at the 52nd Senior National (Men) Handball Championship-2023, held in Srinagar, Jammu & Kashmir on 5th September, 2023.





Indian Railways Cycling team won the overall third spot at the 14th USIC (World Railways) Cycling Championship held in Mols Bjerge, Denmark from 7th to 11th September, 2023

Rail Coach Factory Kapurthala Won 67th All India Railway Golf Championship

On 21st September, 2023 Rail Coach Factory Kapurthala won the All India Railway Golf Championship. RCF team stood first with a score of 434. NWR team secured the first runners up position with a score of 464 while the team of CLW also scored 464 strokes and got the second runner up position. On this occasion, the awards were distributed by Shri Ashesh Agrawal, GM/RCF. The RCF team led by R K Verma Yuvraj



Singh, Jagmohan Singh and Randhir Singh received the coveted T S Russell Cup from the GM. Besides, Yuvraj Singh(RCF) got the credit for winning the longest drive and closest to the pin competition. He was also adjudged the Best Golfer with gross score of 135.

WR Powerlifters Brought Laurels at the Senior National Equipped Power Lifting Championship 2023





Western Railway's powerlifters won many medals at the recently concluded 49th Men and 41st Women Senior Equipped Powerlifting Championship held at Kashipur. The Men's Team won 6 Gold Medals and 1 Bronze Medal while the Women's Team won 3 Gold Medals and 3 Silver Medals. Shri P. Suresh won the Gold in 54 kg weight category. Ms. Samruddhi Deolekar won Gold in 63 kg weight category. While representing their respective states, WR Powerlifters Ms. Abhirami won Gold in 84 kg weight category, Ms. Sharmila De won Silver in +84 kg category, Shri Apoorv Dubey won Silver in +120 kg category and Shri Govindraj K won Bronze in 83 kg weight category.

34th All India Railway Protection Force Wrestling Championship held in WCR

General Manager, West Central Railway Shri Sudhir Kumar Gupta conferred awards to players from WCR in 61 kg, RPSF in 70 kg, Northern Railway in 79 kg and WR in 86 kg won Gold Medals at the 34th All India RPF Wrestling Competition held at Railway Stadium Jabalpur. The closing ceremony and prize distribution ceremony of the wrestling competition were held on 25th August, 2023.



National Sports Day Celebrated Over NCR



On the occasion of National Sports Day, 14 players and coaches of North Central Railway, who have performed outstandingly during the last one year, were honoured by Shri Satish Kumar, General Manager. International gymnast of North Central Railway Shri Aditya Singh Rana, cricketer Ku. Shiba Kothari, Shri Maqbool Ahmed Hockey Team Manager, Ms. Komal Kohar Weightlifter, athlete Ms. Kavita Yadav, weightlifting coach Mr. Jitendra Nath Singh, Greco Roman Wrestler Mr. Ravi Rathi, Powerlifter Mr. Amanpreet Singh, cricket coach Ku. Hem Lata Kala, table–tennis players Mr. Varun Singh and Mr. Swaran Singh Thakur, hockey players Mr. Arjun Sharma and Amit Yadav and cricketer Mr. Kartikeya Kushwaha were among the sportspersons.

Metro's Women TT Team Won Bronze Medal in the 69th All India Railway Table-Tennis Championship

Metro Railway's Women Table-Tennis team won the Bronze Medal in the Team Championship of the 69th All India Railway Table-Tennis Championship, 2023-24 held at Maligaon, Guwahati from 7th to 11th August, 2023. Seven Railway teams participated in this Championship. The members of this Women Table-Tennis team were Shreya Ghosh, Anushree Hazra, Rupsa Bhattacharya, Moumita Dutta and Poymantee



Baisya. In the third, fourth position decider, Metro women defeated WR women by 3-1. Shri P Uday Kumar Reddy, GM/Metro Railway congratulated all the team members for their performance.

SCR Women's Kabaddi Team Won All India Kabaddi Tournament



South Central Railway Women's Kabaddi Team won the All India Kabaddi Tournament held at Manapparai, Tiruchirapalli, Tamil Nadu from 31st August to 3rd September, 2023. Total 24 teams participated in the Tournament. In the finals, SCR team defeated PKR by 28-20 score and won the tournament. Ms. Pinky Roy of South Central Railway was awarded as Best Player of the Tournament.

Shri Arun Kumar Jain, General Manager congratulated and complimented the team members for their victory.

Inter-Divisional Athletics Competition Organised

West Central Railway, organized an inter-divisional athletics competition and honoured the medal-winning players of WCR at the Railway Stadium on 1st September, 2023. Players who won medals for WCR in international and national-level competitions were honoured including Shri Kamal Chawla, Ms. Khushboo Patel, Shri Tushal Singh, Shri Navneet Singh Virk, Shri Naveen, Shri Jasbir, Shri Jaideep and Shri Amit Kumar. In this inter-divisional competition, Headquarters was declared the overall winner and Jabalpur Division was declared the runner-up.



Redevelopment of Stations





Hafizpet Railway Station of Telangana will be equipped with modern amenities like lifts, escalators, upgraded waiting halls, etc.





Donakonda Railway Station of Andhra Pradesh will feature modern passenger amenities.





Kota Jn. Railway Station of Rajasthan after redevelopment will feature an iconic building, attractive facade, and a spacious parking area with many more amenities.





Telangana's Hi-Tech City Railway Station will be redeveloped with extensive modern facilities.





Rajasthan's Alwar Junction Railway Station will be revamped with modern amenities.





Maharashtra's Latur Railway Station will be equipped with well-furnished waiting halls, lifts, escalators and better passenger information systems.





The proposed design of Ganj Basoda Railway Station in Madhya Pradesh, to be redeveloped with superior standards infrastructure.





Upon redevelopment, passengers will witness the grand metamorphosis of Damanjodi Railway Station in Odisha, boasting modern facilities. Look at the proposed design, which is a complete contrast to its current condition.





The proposed design of Assam's Diphu Railway Station shows a commendable enhancement of station infra to follow upon redevelopment.





The Ramganj Mandi Jn. Railway Station in Rajasthan is set to undergo a major transformation, enhancing passenger experience with modern facilities.





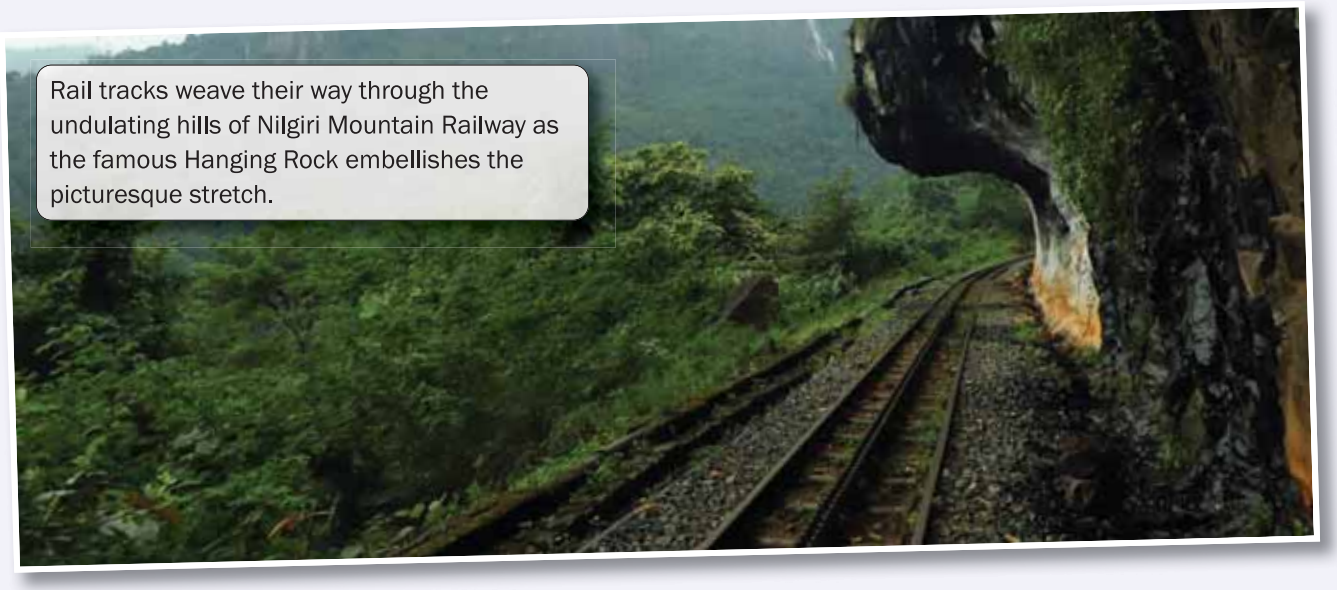
Upon redevelopment, Haryana's Kalka Railway Station will offer numerous modern facilities for passenger comfort and convenience. Furthermore, the proposed design portrays an amalgamation of local heritage and culture in its architecture.



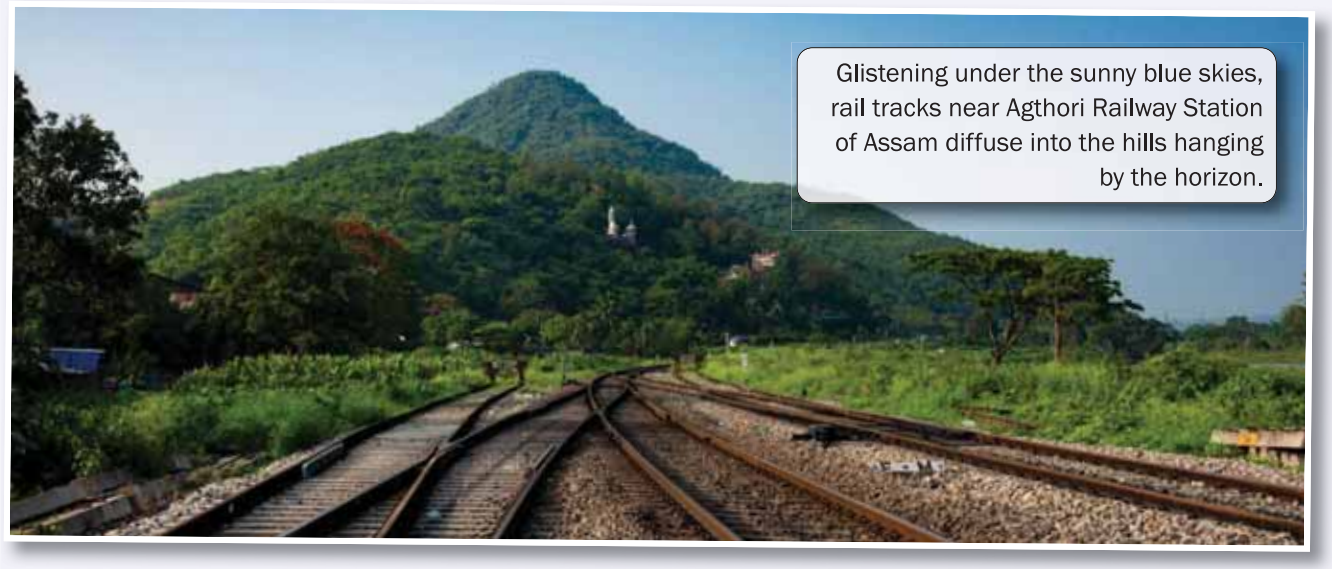


The proposed design of Sirhind Jn. Railway station in Punjab which undergoes a stunning revamp for an elevated experience for travellers.

Photo Gallery



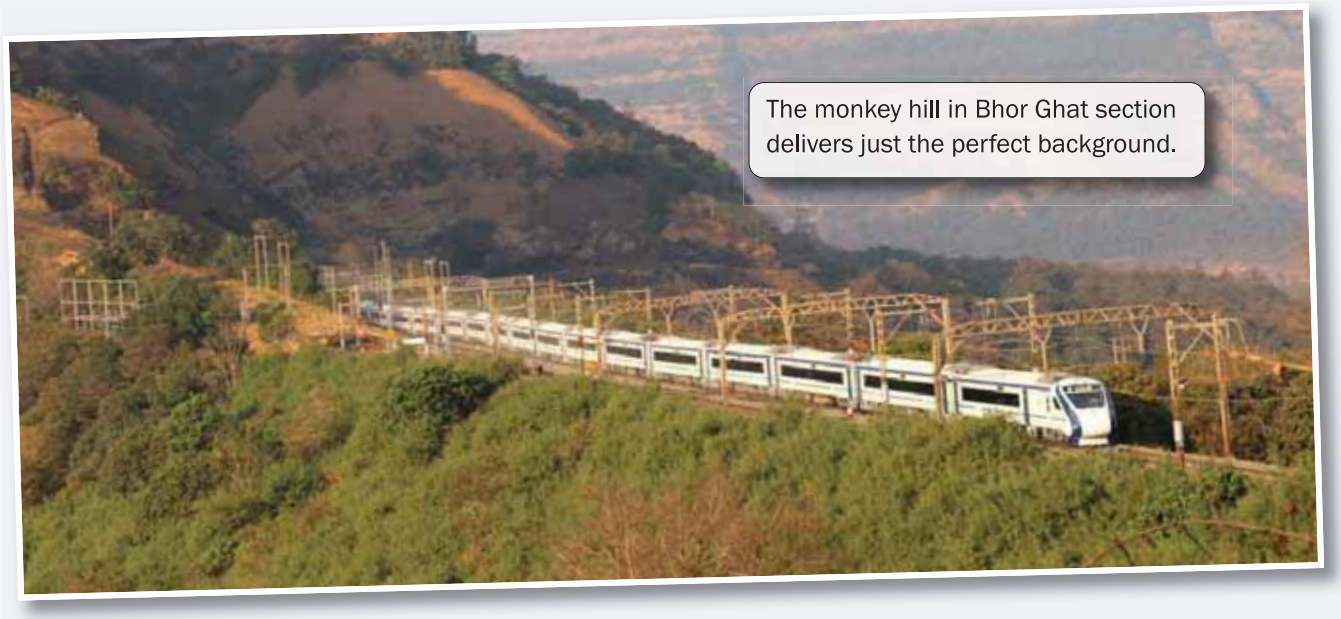
Rail tracks weave their way through the undulating hills of Nilgiri Mountain Railway as the famous Hanging Rock embellishes the picturesque stretch.



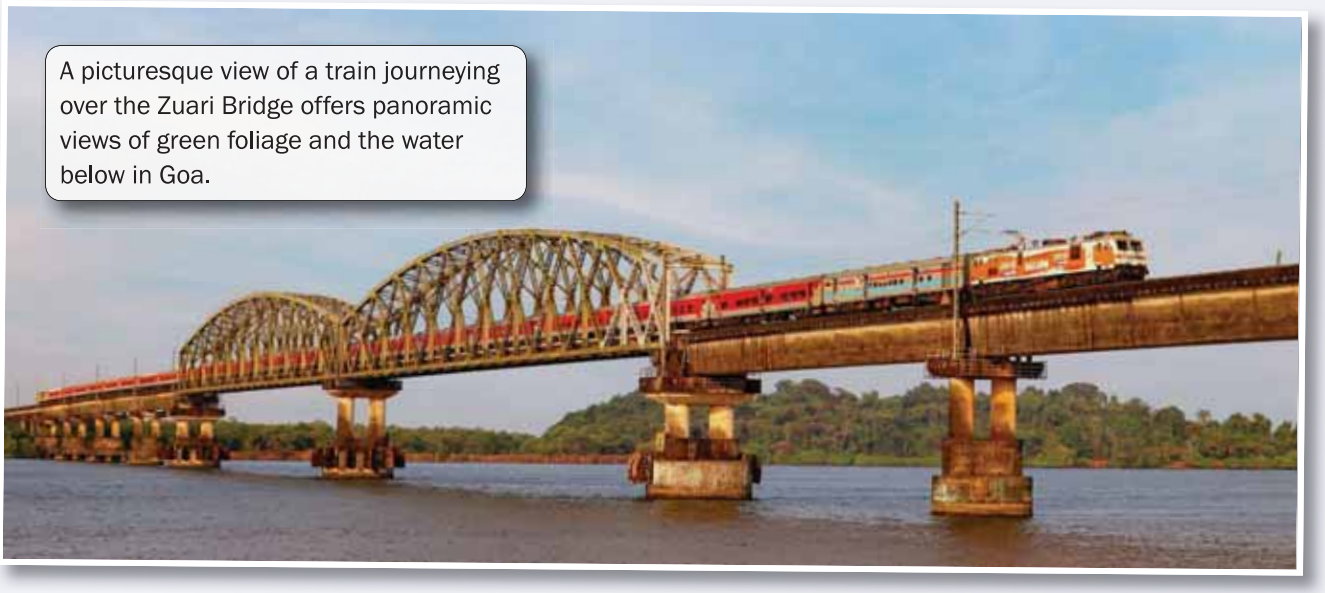
Glistening under the sunny blue skies, rail tracks near Agthori Railway Station of Assam diffuse into the hills hanging by the horizon.



A rail track serenaded by a lush canopy in Hendegir, Jharkhand.



The monkey hill in Bhor Ghat section delivers just the perfect background.



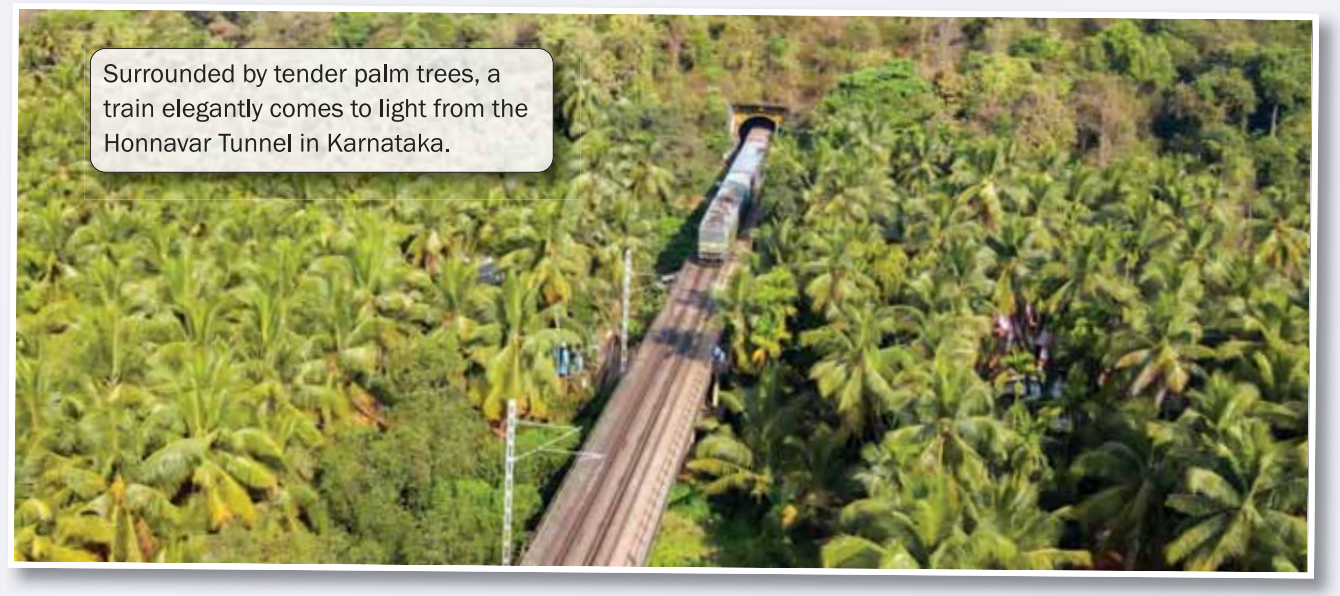
A picturesque view of a train journeying over the Zuari Bridge offers panoramic views of green foliage and the water below in Goa.



A train gracefully passes through the picturesque Gurpa-Gujhandi Ghat Section, surrounded by lush greenery.



Enveloped in terrain and sunflowers, the Bengaluru-Dharwad Vande Bharat Express



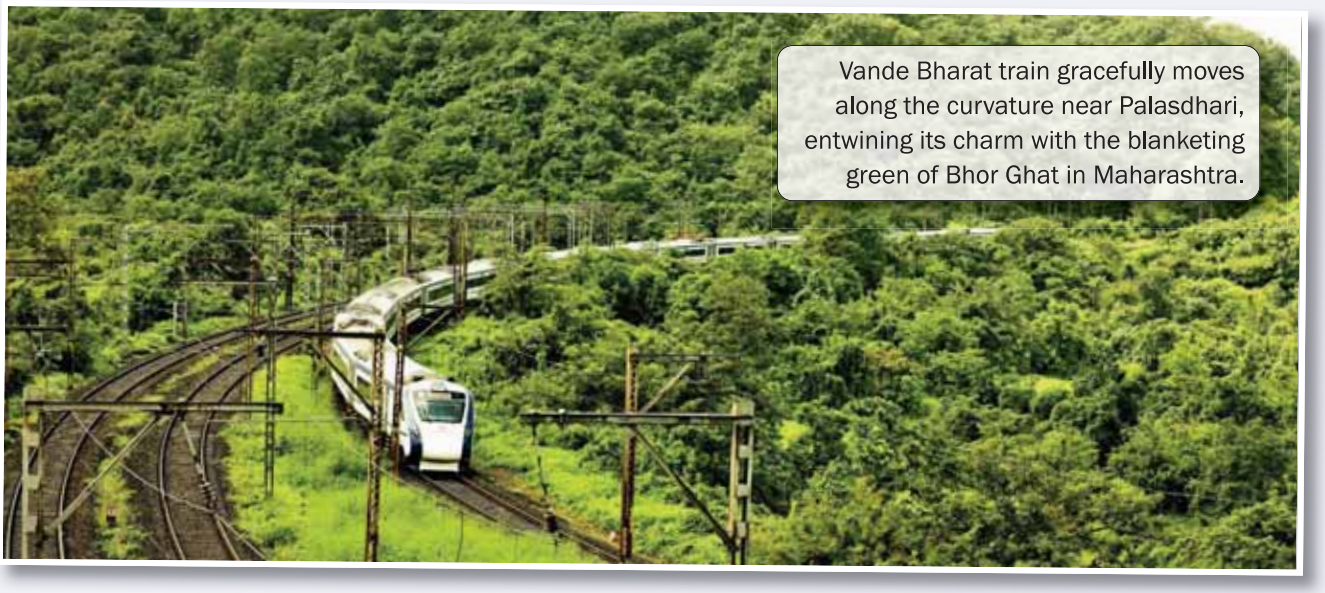
Surrounded by tender palm trees, a train elegantly comes to light from the Honnavar Tunnel in Karnataka.



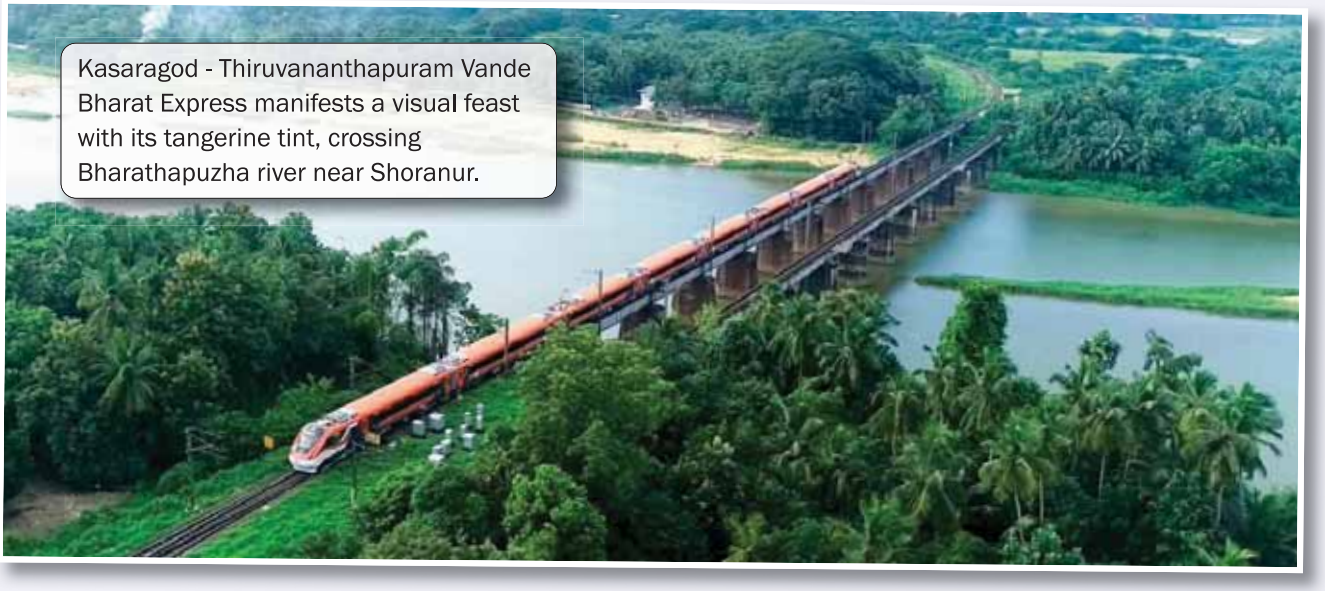
A tranquil garden blooms along the rail tracks near Khirai in Howrah-Kharagpur section in West Bengal.



As the gleaming golden day melts into a soothing dusk, the Dharwad-KSR Bengaluru Vande Bharat Express nudges along the track relentlessly.



Vande Bharat train gracefully moves along the curvature near Palasdhari, entwining its charm with the blanketing green of Bhor Ghat in Maharashtra.



Kasaragod - Thiruvananthapuram Vande Bharat Express manifests a visual feast with its tangerine tint, crossing Bharathapuzha river near Shoranur.

Ground Penetration Radar Technology in Indian Railways

Shri. S.K.Barnwal
ED/Track Monitoring,
RDSO, Lucknow

Shri Rahul Singh
Director/Track Machine
RDSO, Lucknow

Abstract: The Ballast layer is designed to absorb the impact and dynamic energy of a passing train and to distribute the loads evenly over the formation layer to preserve a smooth ride. It is important that the Ballast layer remains free of fines. Contaminated Ballast causes an unstable pressure distribution on the subgrade and may lead to unwanted and undesired rates of deterioration of assets. On Indian Railways, assessment of attention required to Ballast in the form of deep screening of track was earlier based on criteria of passing of 500 GMT or 10 years. The assessment criteria for deep screening of main line tracks have now been modified on the basis of available clean Ballast cushions. At present, there is no scientific method being adopted to check the available clean cushion and it is done by manual methods of collecting samples which is time–taking, expensive and highly subjective. In the present paper, an effort has been made to bring out the advantages of adopting Ground Penetration Radar technology for analysing the condition of Track Ballast and to assess the availability of a clean cushion for making scientific decisions about Ballast renewal.

Introduction:

Ground Penetrating Radar (GPR) is a fast and effective electromagnetic survey technique utilized in the field of subsurface and underground explorations and is widely used in highways, archaeology and other fields. This technology uses electromagnetic waves of the frequency of radio waves for assessing conditions of subsurface strata.

The principle of GPR operation is based on transmission of short electromagnetic waves by an antenna into the subsurface, the subsequent reflection, scattering, and refraction of this energy from subsurface interfaces, and the receiving, recording, and display of this reflected energy. The data obtained from GPR testing represents the energy that is reflected off subsurface boundaries back to the radar antenna.

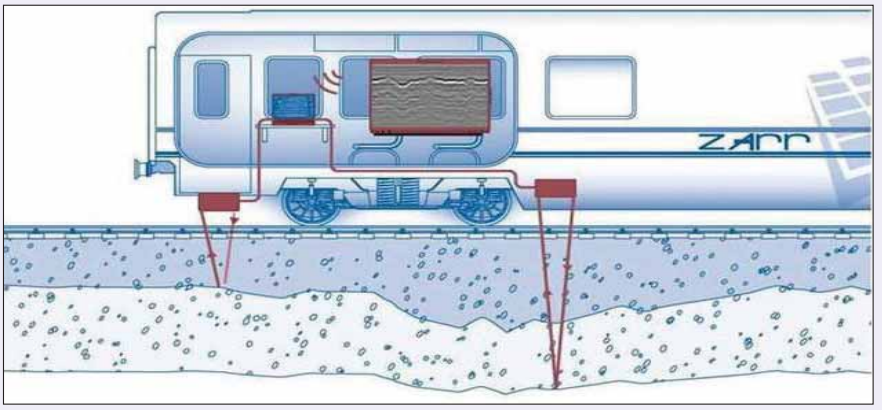
GPR requires two main pieces of equipment—a transmitter and a receiving antenna. The transmitter sends electromagnetic energy into the soil and other material.

Ground Penetrating Radar works by emitting a pulse into the ground and recording the echoes that result from subsurface objects. GPR imaging devices also detect variation in the composition of the ground material. If the electromagnetic impulse hits an object, the density of the object reflects, refracts, and scatters the signal. The receiver detects the returning signals and records variations within them. The GPR system has software that translates these signals into images of the objects in the subsurface. This is how it is used to map structures and utilities buried in the ground or in man-made structures.

Ground Penetrating Radar signals can be used to find a wide range of items. GPR is often used to map items made of materials such as metal, plastic, PVC, concrete, natural materials, etc. GPR is frequently utilized to detect underground utility lines and pipes, changes in ground strata, geological features and rock obstructions, air pockets or voids, excavated and back-filled areas, groundwater tables, bedrock and many more.

GPR application in Railways:

GPR application in railways uses electromagnetic waves of ultra high frequency (300– 3,000 MHz,



wavelength 1–0.1 m) and enables the measuring of layers thickness, detection of changes on structure or on material properties along the line.

It can also detect different types of defects such as Ballast pockets, fouled Ballast, poor drainage, subgrade settlement and transition problems, depending on their extension. These defects are generally the causes of vertical deviations in track geometry and they cannot be detected by the common monitoring procedures, namely the measurements of track geometry.

For above functionality, high speed GPR antennas are used and the same are being used to conduct Survey of railway track at speeds upto 180 kmph. The collected data is then analysed by high-end customised software and Expert Geophysicists, to finally assess the condition of the Ballast.

Importance of Maintenance of Ballast Bed:

Ballast is an important component of track and plays a very important role in overall track strength, following are the important functions of Track Ballast:

- To distribute the axle load uniformly from sleepers to a large area of formation.
- To provide elasticity to the track. It acts as an elastic mat between subgrade and sleepers.
- To provide a levelled bed or support for railway sleepers so that the desired cross level is maintained.
- To hold the sleepers in a firm position while the trains pass by.
- To prevent the longitudinal and lateral movement of sleepers.
- To offer a good drainage to the track.

To achieve the above functionalities with the desired level of efficiency, the Ballast is required to have the following qualities.

Characteristics of Good Ballast:

Ballast must have following characteristics for carrying out the above discussed functionalities:

- It should have sufficient strength to resist crushing under heavy loads of moving trains.
- It should be durable enough to resist abrasion and weathering.
- It should have a rough and angular surface so as to provide good lateral and longitudinal stability to the sleepers.
- It should not make the track dusty or muddy due to its crushing to powder under wheel loads.
- It should allow for easy and quick drainage of the track.

Deterioration of Ballast:

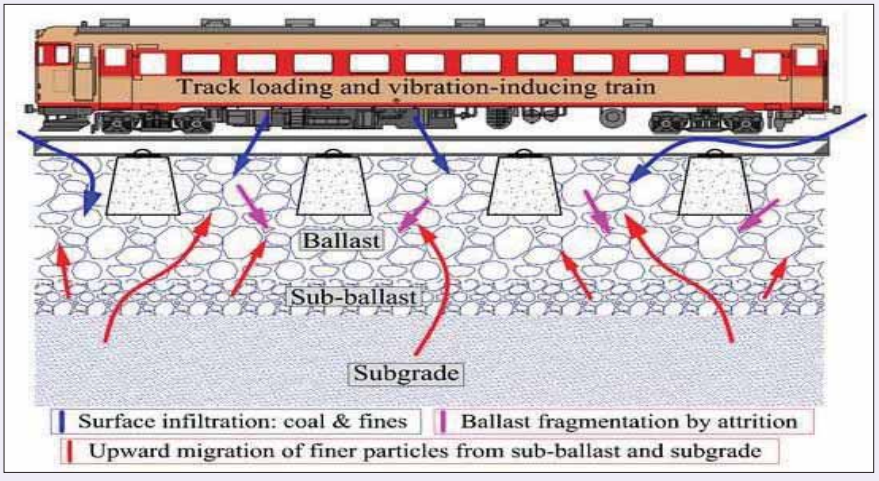
During the course of usage, the Ballast laid in track gets deteriorated and loses its required properties which are essential for effectiveness of the Ballast, following are the few reasons as why the track Ballast gets deteriorated:

- Under heavy axle loads, Ballast gets crushed at a faster rate and thus the Ballast loses its required property of Gradation.
- Due to crushing of Ballast under load, the percentage of finer particles increases and thus it affects the property of required elasticity and drainage as the Ballast gets choked up due to presence of unwanted fines.
- In areas with heavy rainfalls and peculiar geographical territories like cutting and tunnels etc. rain water when flowing over track Ballast deposits the silt and fines carried by it on Ballast causing the increase in fine particle concentration.
- In areas where Goods trains are carrying commodities like iron ore and coal, due to droppings etc. the fine content of Ballast increases and thus it reduces the Ballast properties drastically.
- Punchering the Ballast into the subgrade of formation also leads to fouling of the Ballast.

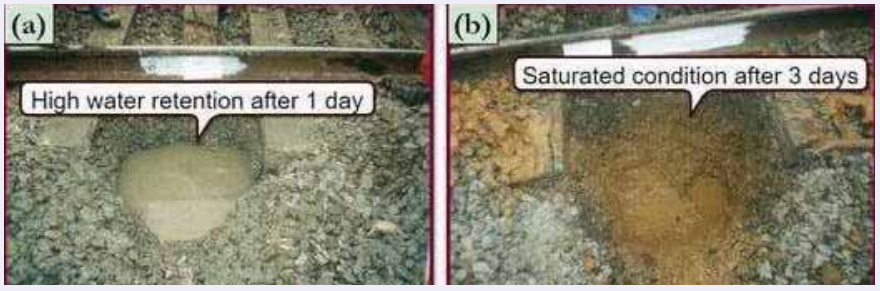
Effects of Deterioration of Ballast:

Following are few of the major effects on track structure and maintenance of the track due to deterioration of Ballast:

- Drainage—With increase



in percentage of fines due to deterioration of Ballast



the drainage of Ballast gets hampered and water is retained in the track and due to water retention the deterioration of Ballast is further increased and also as the water retention changes the frictional forces acting between the Ballast particles the load transfer is not as desired.

- In the above figure (a) Ballast which is comparatively less deteriorated than and we can clearly see that in a similar situation of rainfall water retention in (b) is much more than (a).
- Due to an increase in the percentage of fines due to Deterioration of Ballast the desired elastic properties of track are not achieved and due to improper behaviour of track life of other assets like Rails, Sleepers and Fittings comes down.
- Due to the increase in Deterioration of Ballast, the requirement of maintenance inputs gets higher as retention of packing of Ballast is severely affected.

Ballast Fouling and Ballast Fouling Indices:

Before we discuss how the technology of GPR can be used on railway track and its benefits for Indian Railways, it is important that we understand the concept of Ballast fouling and Ballast Fouling Index.

Ballast Fouling is defined as the presence of unwanted contaminants of finer sizes which fill up the voids between the Ballast and decrease the required qualities of Ballast like drainage, strength, resilience and elasticity etc.

Ballast Fouling Indices (BFI) are formulas for mathematically representing the extent of fouling of Ballast. There are various formulae being used over different railways. It is important to have a BFI as it helps to decide the mathematical limits based on which the decision of attention to Ballast can be taken.

The GPR-derived fouling index is based on measurement of the level of signal scattering within the Ballast layer and is independent of the Ballast layering.

Many different formulae for quantifying Ballast fouling have been proposed and following are a few being used over different railways:

1. Selig's fouling index developed by Selig and Waters developed (FI), which has since been extensively adopted in the US.

   FI=P4%+P200%,

   where P4% is the percentage by mass of the sampled Ballast material finer than the 4.75 mm (No. 4) sieve, and P200% is the percentage by mass finer than the 0.075 mm (No. 200) sieve.

   Following guidelines are used to identify the condition of track Ballast.

Category	F1 (Fouling Index)
Clean	<1
Moderately Clean	1 to <10
Moderately Fouled	10 to <20
Fouled	20 to <40
Highly Fouled	>= 40

2. Australian Railways' formula for Fouling Index; the formula for fouling index F1P is defined as

   F1P = P0.075 + P13.2

   where, P0.075 = Percentage passing 0.075 mm sieve

   P13.2 = Percentage passing 13.2 mm sieve

   Following guidelines are used to identify the condition of track Ballast.

Category	F1 (Fouling Index)
Clean	<2
Moderately Clean	2 to <10
Moderately Fouled	10 to <20
Fouled	20 to <40
Highly Fouled	>= 40

3. South African Railways' formula for Fouling Index: This index takes into consideration a larger variety of sieves in assessing Ballast fouling and sets a cleaning criterion at 80%.

   FI=[0.1P0.15]+[0.2P1.18]+[0.3P6.7]+[0.4P19],

   where P0.15=(% by mass of

material finer than the 0.15 mm sieve) ×100 27, P1.18 = (% by mass of material finer than the 1.18 mm sieve)×100 11.5, P6.7 = (% by mass of material finer than the 6.7 mm sieve) × 100 18, P19 = (% by mass of material finer than the 19 mm sieve) × 100 27.

4. Volumetric fouling index: A volumetric fouling index (VFI) was established by Ebrahimi et al. to evaluate the actual volumes of contaminants in Ballasts subjected to different fouling agents; the VFI is expressed as

   VFI=FI × GrsGfs,

   where FI is the fouling index expressed in Equation selig's fouling index, Grs is the specific gravity value of the reference Ballast material (approximately = 2.6), and Gfs is the specific gravity value of the present fouling agent.

GPR technology is also now being used for assessing the condition of Ballast for Ballast fouling (presence of unwanted percentage of finer particles) and clean Ballast depth.

Advantages of GPR of Indian Railway Track:

Monitoring Ballasted trackbed with ground penetrating radar (GPR) will allow decisions to be made on timely and cost effective maintenance interventions.

Generation of exception reports for track-bed condition including Ballast fouling and formation failure will result in accurate prioritisation of problem trackbed and delineation of the extent of remedial works required by:

- Deployment of Ballast cleaning and tamping machines to where they are most needed.
- Reduction in the number of interventions during the life of the Ballast through condition-based planning.

Planning of GPR on Indian Railways

On Indian Railways it is planned to get the system installed in one of the Track Recording Cars. By GPR survey, the condition of Ballast (fouling level) will be known and thereafter deep screening of Ballast will be planned on actual condition of Ballast. This will be a scientific and rational approach to the deployment of Ballast Cleaning Machines (BCM) and is likely to significantly reduce the requirement of deep screening. This will also lead to a predictive system of track maintenance with regards to deep screening of Ballast. Moreover, a clear scanning of problems below Ballast level will also be available in locations of formation troubles, which will help in the decision of proper formation treatment solutions.

The desired result shall be obtained by deploying two types of GPR antennas in combination; high frequency low wavelength antennas in the range of 2GHz for addressing issues of Ballast fouling and low frequency high wavelength antennas in the range of 700 MHz to assess the formation related issues.

GPR and track geometry

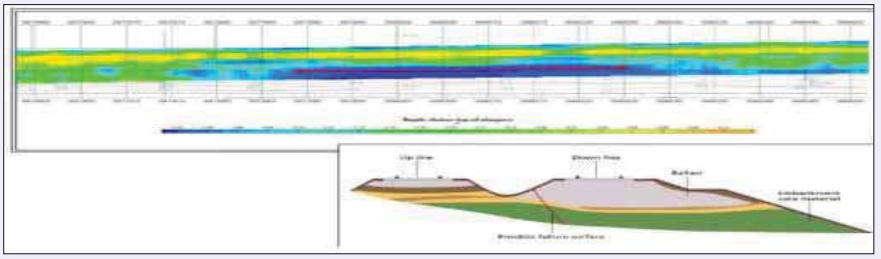
Combining the GPR derived indices with track geometry data shall also provide an efficient means of identifying those track geometry faults that are associated with an underlying trackbed problem and helping determine the extent of that problem. It can also highlight areas of moderate or poor trackbed integrity that may not yet be manifested as a track geometry fault.

Data from multi-sensor survey platforms including GPR and track geometry, when integrated as part of a holistic strategy for prioritising and planning appropriate maintenance, will provide unique



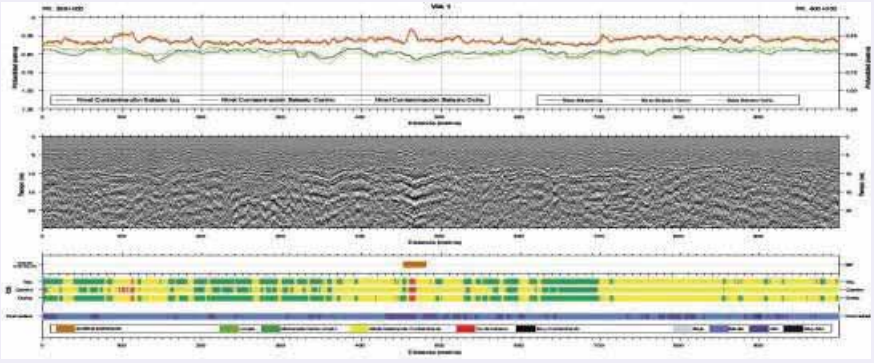
condition-based information and significant cost savings. Thus combining track geometry measurements with GPR provides unique condition-based information to plan a holistic and cost effective trackbed management strategy.

Indian Railways is in the process of introducing this technology through a service contract to cover almost all the important routes, which is approx. 50,000 kilometres. In the above work which is to be done under Service Contract, the experts will also develop the Ballast



Picture showing sample of report detailing formation related issues.

Fouling Index formula for Indian Railways. Thus, by using the GPR technology on Indian Railways, we will have a scientific rationale for prioritizing Ballast cleaning.



Sample report of a stretch of 10 kilometres displaying the detailed BFI values as per predefined ranges.

Previous experience of IR on GPR vis-a-vis TRC Mounted GPR Survey:

Earlier the Subsurface Interface Radar System was procured by RDSO in 1999 from the USA. It was a push trolley mounted system–bulky and heavy, difficult in handling, very less speed of survey and limited applicability, only display on monitor without any analysing software for report generation. System provided limited useful results as the required expertise to interpret the output of the survey was not available with RDSO. Displayed images of the Ballast were not very clear as the frequency used was inadequate (1,000 MHz as compared to the tentative frequency of 2 GHz being used at present for GPR survey of Ballast). Advanced modelling techniques were required to allow complex GPR data to be interpreted by defining probable subsurface properties causing the signal which was not possible at that time due to limitation of technology.

The current system is an advanced version which uses hardware capable of recording data at high speed along with software application to interpret the data which was done earlier by experts. Present system being planned for induction in IR on service mode will be a vehicle (TRC) mounted with capability for recording at high speed, higher output (3,000-4,000 km per month), analysing software and involvement of firms geophysicists for interpretation of GPR data for generation of user friendly reports.

Cost effectiveness of TRC mounted GPR Survey

This system of survey for Ballast fouling other than being a scientific method of assessing the requirement of Ballast cleaning is also a very cost effective method as the average cost of survey of Ballast bed would come out to be around ₹6,500/- per kilometre. The average cost of Ballast cleaning is to the tune of ₹25-30 lakhs per kilometre. Therefore, the survey cost is only around 0.2%-0.3% of the cost of Ballast cleaning. Further, there are quite likely chances of reduction in the total number of kilometres where Ballast cleaning is required when the GPR system is adopted on IR.

Conclusion

The growth in rail traffic and associated increase in the cost of occupying track (traffic blocks) for routine inspection and maintenance is necessitating a change in the maintenance planning paradigm. The induction of GPR technology for making decisions for prioritising Ballast cleaning is an important step towards a more scientific approach on the subject. After the first round of GPR Survey, this technology may be adopted on a regular basis and with the application of several sets of data, in future predictive planning of the maintenance can also be done.

References and Acknowledgements

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Understanding Distribution of Load in Railway Wagons

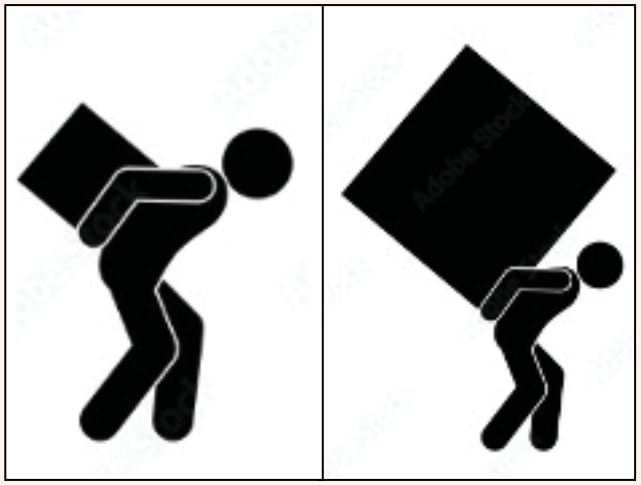
Shri Prashant Kumar Singh
Asst. Div. Mech. Engineer,
South Western Railway

Load distribution is given very high importance in freight trains, but not in passenger trains. Often it is stressed that loading pattern drawings should be strictly followed for loading in wagons, but not so for passenger coaches. Let's explore why load distribution is so important in case of freight stock, but not so much for passenger coaches. We can gauge its impact by the sheer number of derailments that have happened due to uneven load distribution in freight trains.



As can be seen in the illustration above, 6.4 tons of payload is distributed on the tare weight (self-weight) of 39.4 tons for passenger trains. Whereas, in case of a freight train, 58.8 tons of payload is distributed on the tare weight of 22.5 tons.

The payload in passenger coaches seldom dominates the tare weight, but the payload is always dominating in case of a wagon. If you use the figure below as a metaphor for this situation, it is easy to predict that the freight wagon would be more prone to instability when subjected to disturbing forces.



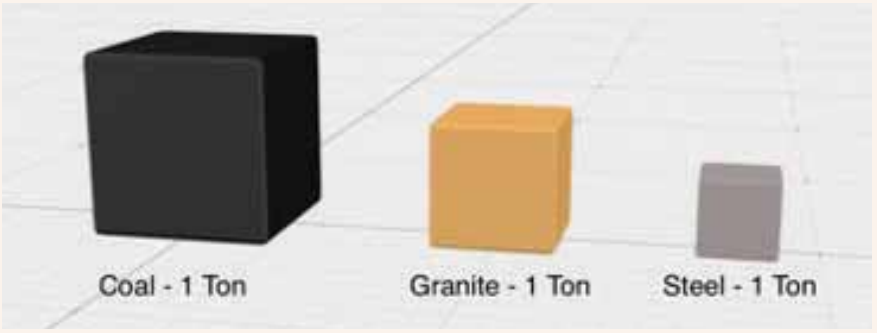
Passenger Coach **Freight Wagon**

This problem can be easily solved by reducing the payload. But freight wagons are designed to carry heavy loads and earn money for our organization. So, reducing the payload would mean reduction in carrying capacity and earnings of Indian Railways. Hence, the better and accepted solution is to stabilize the wagon by ensuring an even and symmetrical load distribution. Even and symmetrical load distribution would lead to a similar load on all the wheels and the chances of instability become minimal.

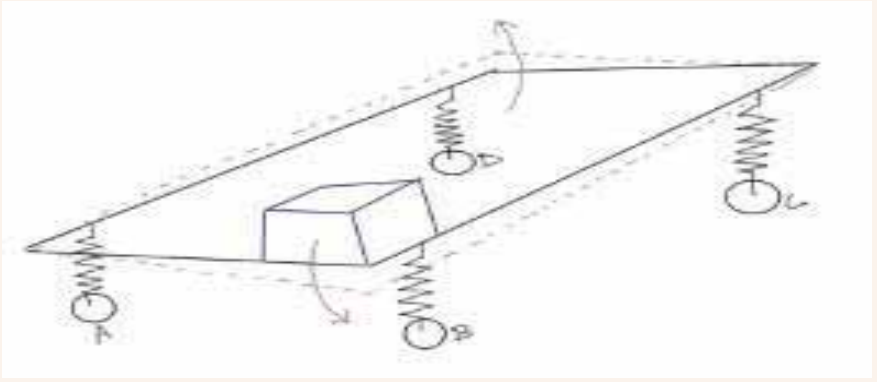
The criticality of load distribution varies different commodities loaded in the freight stock. For comparison, consider three commodities: Coal, Granite, and Steel coils. The figure on the next page demonstrates the relative volume occupied by 1 ton of each of these commodities.

At this point, another concept comes into picture, Load Concentration. Higher load concentration means that more load will be distributed on a smaller area. As can be seen in the representation on the next page, steel has the highest load concentration as it occupies the minimum space for the same mass amongst the three. So, the amount of imbalance created by steel will be highest if it is not placed symmetrically. Hence, the load distribution becomes very crucial when it comes to steel loading, whereas the impact of improper load distribution is less severe in coal consignments.

So, now that we are clear that load distribution plays a crucial role in wagon's stability and that steel has



more effect in causing imbalance out of the three commodities. Let's move ahead to see what effect it has on wagon performance and how it may lead to derailments. The sketch below shows a simplistic model of the wagon demonstrating the effect of uneven load distribution.



Assume that a steel consignment is placed on one of the corners (corner B) of the wagon floor. It will lead to overloading of the wheel B and at the same time it will lead to off-loading of the wheel D. Due to off-loading of the wheel D the downward force which helps maintain the rail wheel contact will be reduced. In case of curves or points and crossings, the wheel would have a higher tendency to mount over rail leading to derailments. At this point, if we consider the centrifugal force experienced by the wagon when negotiating a curve, the problem is aggravated leading to higher chances of off-loading.

In a nutshell, the ideal situation for loading is that the combined centre of mass of the load should coincide symmetrically with the wagon i.e. both longitudinally as well as laterally. Since the real world does not follow ideal rules, it is very essential that the combined centre of mass of all the loads should be as close as possible to the wagon's centre of mass. Identifying the wagon centre of mass is very simple. In almost all the symmetrically designed objects, the centre of mass is generally the geometrical centre of the object and all the wagons are symmetrically designed both laterally and longitudinally. The closer the load is to the wagon's centre, the more stable the system will be. As the load centre moves away from the wagon's centre, the system moves towards instability.

Now, the question arises: how much variation is allowed and what limits should be followed? It is very difficult to narrow down to a single value as many factors play a role into it: speed of the train, cant of the track, curvature of the track, load, type of load, design of wagons, rail wheel interaction, suspension system of the wagons etc.

There are standards set in different parts of the world which try to ensure even and symmetrical load distribution in wagons. Some of the standards are:

- As per the International Union of Railways (UIC), the ratio of the masses per bogie should be less than 3:1 and the ratio of the load between the wheels (left/right) of a given axle should be less than 1.25:1.
- As per the Association of American Railroads (AAR), longitudinally, the centre of weight should have a certain distance from either trolley centre, which depends on the ratio between load weight and load limit. Laterally, the load must be located to equalize the weight.
- As per the Chinese Railways (CR), the transversal distance between the cargo's gravity centre and the wagon's geometrical centre should be within 100 mm. the difference between the masses per trolley should be no more than 10 tons and the mass of the cargo on either bogie should not exceed half of the loading capacity of the wagon.

As you may have noticed, there are no precise standards mentioned in these guidelines. The offset values allowed in the standards can be said to be "empirical". But the central theme of these guidelines converges on the same idea: Offset should be avoided to the maximum extent practically possible, and loading should be as symmetrical and even as feasible.

INDIAN RAILWAYS—ALWAYS AHEAD

Shri Sekhar Chakraborty
Chief Commercial Inspector
South Eastern Railway



There are a few organizations that have existed for more than 150 years (first train commenced on 16th April, 1853) in the world like Indian Railways. It's a big, gigantic, mammoth and highest employer in the universe.

It's the life of the nation, plays a very pivotal role in facilitating of the day-to-day socio-economic activities of an emerging economy that can not be thought in other organization.

During the last 180 years this organization has emerged as the second largest system of its kind. Afterall Indian Railway is the backbone of India's economic, social and cultural life, undoubtedly it must be making some business, but more than making profits, it must strengthen the fundamentals of overall composition of the economy of the nation.

There are two main segments through which this department earns for Railways. Freight marketing (FM) branch and Passenger marketing (PM) branch. As I have been working in PM branch, I will focus my discussion on 'PM' branch only.

Since the commencement of first train over IR, various modes of tickets have been used like paper tickets, card tickets etc. Use of paper tickets and card tickets are being used manually.

A revolutionary change came in force in the year 1986, when the first server based computerized reserved ticket was issued to passenger. Gradually it expanded to PAN-INDIA basis and presently covering 100% reserved tickets. No manual reserved ticket is issued presently.

Expansion is rapid in reserved segment and with the invention and expansion of internet. IR entrusted the task of issuance of tickets (reserved) to passengers to Indian Railways Catering and Tourism Corporation (IRCTC). This also could not meet up the need of passenger's demand, then

crop up the idea of 'RTSA (Rail Travellers Service Agent)'. These agents could only purchase ticket on behalf of Ticket Suvhida Kendra). The YTSKs are appointed at main cities, malls, universities and passengers are allowed to purchase all types of reserved tickets except 'TATKAL' tickets. Even home delivery provisions are also there. Only nominal fixed charges are to be paid by the passengers in addition to fare.

Apart from these IRCTC has appointed many authorized agents at many places from where a passenger can purchase reserved tickets.

Post-PRS facility is a new concept introduced by Railways where in post-office, PRS (Passenger Reservation System) has been opened to issue reserved tickets.

In many non-rail head locations like DM offices, municipal offices, BDO offices also, PRS have been opened to (NRH) to issue PRS tickets. Moreover, now-a-days in small stations, UTS-cum-PRS counters have been opened, where for 2 to 6 hrs (timings varies from station to station), both reserved and unreserved tickets are issued from the same counter.

Improvement in issuance in reserved ticketing system have been discussed so far, now the qualitative changes and improvements that have taken place in the phase of time in unreserve ticketing segment will be provided too. Right from its inception of first passenger, only unreserved tickets used to be sold except for some special reserved coaches. Paper tickets were used at that time for the passengers with handwritten in ink. Then came carbon process. A few years later card tickets had been introduced, which were called 'printed card tickets (PCT)'. It has still been in existence since its beginning. Not abolished. Kept as a measure of emergency purposes. PCT had some short-comings. PCTs could have been issued and invention of EFT (excess fare ticket) and BPT (blank paper ticket) came out. EFTs are being used by the ticket checking staff on trains to realize fare and penalty on train. BPT issue tickets at Booking offices for the stations for which no PCT is available.

A major revolutionary change came in issuance of unreserved tickets where server-based ticket issuance have been started in the year 2005. It changed the entire scenario of unreserved ticketing system.

Thus, the modalities and concept of 'UTS' (Unreserved Ticketing System) has been developed by CRIS (Centre For Railway Information System). Presently the system has developed furthermore, and the server has been connected to Automated Ticket Vending Machine (ATVM), COATVM (Coin Operated ATVM).

Presently 'App' based tickets can also be available and the App (UTS on mobile/ UOM) can be downloaded from 'Google play store'. Tickets can be booked from 5 km in suburban sections and from 20 km at non suburban sections through mobile App. At station unreserved tickets are issued by STBA (Station Ticket Booking Agent), Halt Agent or Railway Staff.

From outside the Railway premises tickets can be issued through JTBS (Janasadharn Ticket Booking Sewak) and YTSK (Yatri Ticket Suvhidha Kendra).

It's a huge and gigantic network spreading all over the Indian Dominion even in many non-Rail head locations. There are five huge servers functioning at Kolkata, Delhi, Mumbai, Secunderabad and Chennai round the clock in association with CRIS. A large number of modernized hardware and networking equipment are required to successfully running of the entire system.

Moreover, dedicated managers, engineers, technical and non-technical employees and their sincere and tireless efforts have made the huge and voluminous work a tremendous and huge success. That's why we can proudly say 'Indian Railways—Always Ahead'.



Be Healthy–Adopt A Natural Life Style

Shri Kamal Tejwani
Consultant/RITES now working in Rly. Board

Mother nature has designed this body. This human body is working in accordance with laws framed by Nature. Men world over today are suffering from so many kinds of illnesses like cancer, kidney failure, liver failure, heart attack, stroke, etc., because they are not living in tune with the laws and are violating the laws framed by Mother Nature.

There are various systems of medications in the world, each claiming to be superior to other. Nature cure is not an alternative to homeopathy, allopathy, unani or anything. Nature Curis not a system of medicine. It is a way of life. It is a Jeevan Padhati.

Nature Cure is a science by following which the ill can become well; well can become better and better can become still better. It is meant for all. Even healthy people are expected to follow nature cure to improve their health.

Diseases can be prevented easily. Medical men say that diabetes, blood pressure, asthma, etc. are incurable. There are so many other incurable diseases which can be cured by Nature Cure.

It is a science which can be learnt by anyone; even the illiterate ones can also learn this and improve their health.

Diseases are caused because internal activities within the body are not carried in an orderly way. Some organs or the other in the body are not able to do their work properly because we are putting some hindrances in their working by our habits. This is what brings about disease. Disease is a direct result of violation of laws of Nature by man. It is in man's own interest to follow the laws of Nature. If a person is healthy, no disease can come. As darkness has no existence in the presence of light, diseases also have no existence in the presence of health.

If you keep on suppressing these acute diseases with medicines and continue with your wrong habits of living, these acute diseases after some time will take the form of chronic diseases like diabetes, blood pressure, thyroid, arthritis, asthma, skin diseases, migraine, depression, joint pain, knee pain, liver and kidney problems, etc.

If you again keep on suppressing chronic diseases with further medicines, injections, steroids, etc. and continue with wrong ways of living, these chronic diseases will explode after some time in the form of destructive diseases like cancer, heart attack, hemorrhage, cirrhosis, kidney and liver failure, etc.

What carries on internal activities inside our body in an orderly manner is the Jeevan Shakti or the Pran Shakti. When a person is born, he is given Pran Shakti enough to last for 70, 80 or 90 years or more. We, through anger, emotional upsets, greed, over-eating or taking stimulants like tea, coffee, cola, etc. are putting hindrances in the proper functioning of the body. The body still tries to carry out internal activities but in this process extra Pran Shakti is spent i.e. Pran Shakti is wasted which could have been utilized by the body for curing diseases.. There are so many bad habits, the result is the Pran Shakti i.e. energy for eliminatory activities that available



with the result that the body internally becomes insanitary. It is this internal insanitation is the cause of all diseases straight from common cold to dreaded cancer. Diagnosis does not throw light on the cause of disease. The real cause of the disease is to be understood and removed to cure diseases. Diseases are caused by our mistakes. The cure lies in the removal of the cause. The real cause of the disease is to be understood. Nature Curists get advanced chronic patients, declared incurable medically, medical failures. In Nature Cure, the man is put on right path of living to improve the health and remove the disease. As health level starts improving, the diseases start disappearing.

There are many practices which need to be changed with regard to eating and drinking to improve health. There are four factors involved in the matter of food and nutrition.

1st is WHOLENESS. You should take only natural foods as produced by the plant kingdom, as whole as possible i.e. in other words, the foods must not be processed or refined. If the foods are refined, processed or manufactured, we are removing the wholeness. We are removing some minerals, salts, enzymes, vitamins and many other things. Unless the food we take is wholesome, we will not be wholesome i.e. we will not be healthy. Synthetic vitamins, minerals salts, enzymes, they can never do good to you. If any diseases are there, Nature Cure can help you. Even chronic diseases and to some extent destructive diseases can be cured.

2nd is FRESHNESS. The food should be as fresh as possible. It is the fresh food that has a Sun value in it. It is the Sun which energizes the plant through the chlorophyll of the leaves and it is that which gives the vegetables, the fruits, the grains, etc. the vitamins, minerals salt, nutrition, etc.

3rd is ALKALINITY. The lymphatic glands/stream in our body are 80% alkaline or so. If the alkalinity of lymphatic fluid is reduced by our wrong eating, the cells will not be able to get the nutrition and oxygen required by them and they will not be able to remove the waste products from the cells. Hence, we have to take predominantly alkaline food. All processed and refined foods are acidic. White sugar is worst of them. Worse than white sugar is confectionary. Confectionary is 'Infectionary'. Worse than confectionary is hydrogenated oil. We should avoid all these.

4th is FRUGALITY. Be frugal in eating. The quantity of food to be eaten is very important. Unfortunately, the calorie theory by so-called Science tells that the food is a source of energy and the people are asked to eat much more than they really require. Eat less and assimilate more should be the motto.

How much of food one should eat is in Ayurveda. According to Ayurveda, if you divide the stomach into four parts, fill two parts of it or half of it with food. One quarter of the stomach should be left empty for the digestive juices which are released from within when we eat, which requires some space and leave one quarter vacant so that the stomach can expand and contract and do the work of churning food in the stomach. If this vacant space is not left, then the stomach will remain in distended position and it will not be in a position to contract which would hinder the process of churning/digestion.

If all these principles are borne in mind and we say good bye to processed and refined food, we will be healthy. All refined and processed foods are bad. Take only foods and not stimulants. Stimulants are not nutrients. The tea, coffee, cocoa are all stimulants. Even some of the condiments are stimulants; red, green chili, black pepper and there are many others irritate the mucous membrane. Every stimulant is a mild irritant. Anything that irritates the mucous membrane weakens us.

We do not treat the disease. The man follows the right way of living and he cures himself. The real Doctor is within you i.e. the healing power. No vaidya can cure your disease. Only you can cure your disease because the Vaidyanath is inside you. You are your own Doctor.

The only sensible and correct way to prevent and cure diseases, both physical and mental, is to avoid medicines and improve/alter your food habits and by giving both physical and mental rest. In physical rest, giving rest to your digestive organs is one of the most important aspect of physical rest. All this has to be supported with air and sunbaths, light exercises within one's capacity, simple pranayama i.e. Anulom Vilom, meditation, etc. It is also necessary that one thinks positive, have full faith in the efficacy of the system of Natural Life Style and Almighty God and do some social and philanthropic activities (sewa), do pooja, kirtan, etc. to get full benefits of the system.

So, I request you to follow Nature Cure so that everybody remains healthy and enjoys a blissful life.

Test Your Knowledge

1 How many Vande Bharat Express had the Prime Minister flagged off recently?

(a)	(b)	(c)	(d)
9	25	5	10

2 Retiring Rooms at railway staions can be booked for how many maximum hours?

(a)	(b)	(c)	(d)
48	24	12	36

3 In which state is India's longest rail bridge being built?

(a)	(b)	(c)	(d)
Madhya Pradesh	Odisha	Uttar Pradesh	Delhi

4 In how many railway stations the Pradhan Mantri Jan Aushadhi Kendras will be set up by Ministry of Railways?

(a)	(b)	(c)	(d)
100	28	50	65

5 What is the name of the project which will increase rail infrastructure in tribal dominated areas?

(a)	(b)	(c)	(d)
Janjatiya Gaurav Corridor	Janjatiya Rail Marg	Karmyogi Rail Marg	Gaurav Marg

6 What is the name of Automatic Train Protection System.

(a)	(b)	(c)	(d)
RRI	KAVACH	BHIM	Aditya

7 What is the name of the Railway Locomotive Works located in Banaras?

(a)	(b)	(c)	(d)
Banaras Locomotive Works	Diesel Locomotive Works	RCF	MCF

8 Name the India's first vertical lift Railway Sea Bridge.

(a)	(b)	(c)	(d)
Bogibeel Bridge	Howrah Bridge	Pamban Bridge	Netaji Bridge

9 Where is the National Rail Museum located?

(a)	(b)	(c)	(d)
Kolkata	Mumbai	Hubballi	New Delhi

10 What is the name of the University run by the Ministry of Railways?

(a)	(b)	(c)	(d)
Bhartiya Rail University	Gati Shakti University	Indian Railways University	Rail University

Right Answers

1- (a)	2- (a)	3- (a)	4- (c)	5- (a)
6- (b)	7- (a)	8- (c)	9- (d)	10- (b)



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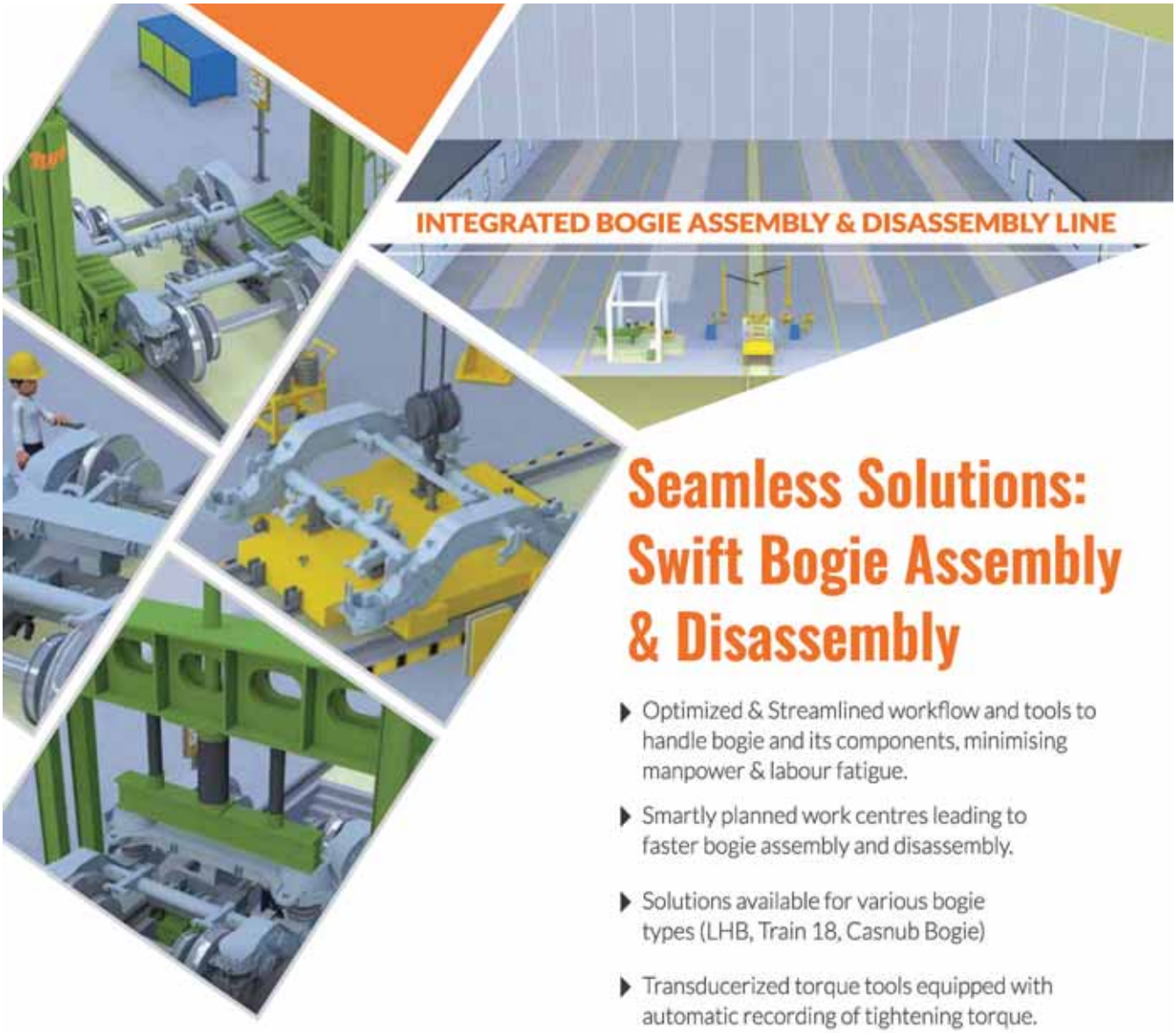
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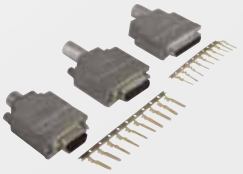
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